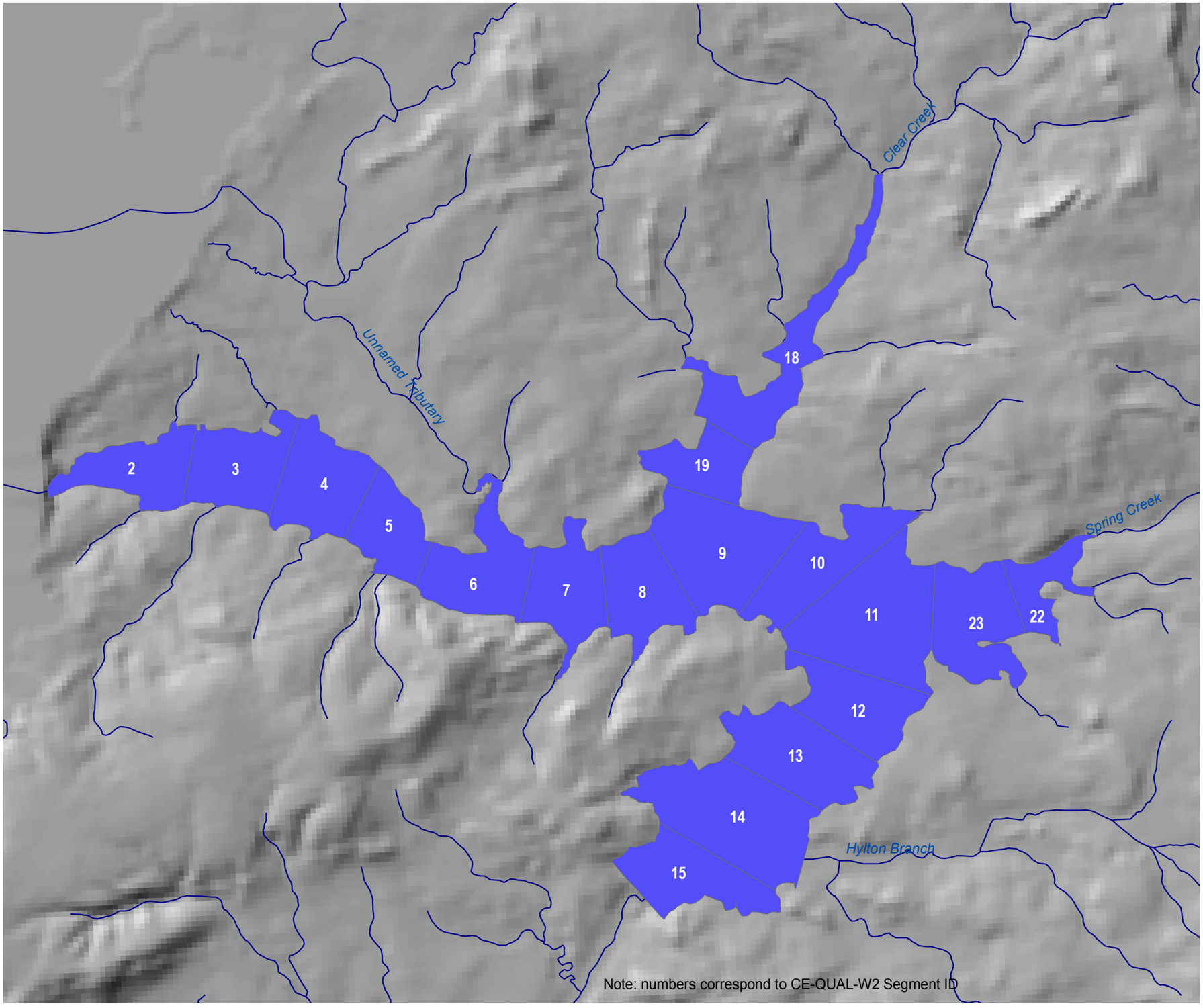
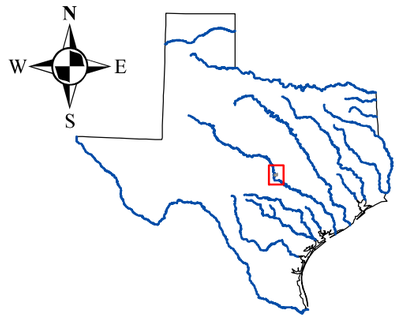




0.4 0.2 0 0.4 Miles

Legend

- Inks Lake segment
- Surface water

Figure 4-1.

Inks Lake CE-QUAL-W2 Model Segmentation

LCRA ENERGY • WATER • COMMUNITY SERVICES

PARSONS

ANCHOR QEA

November 2010

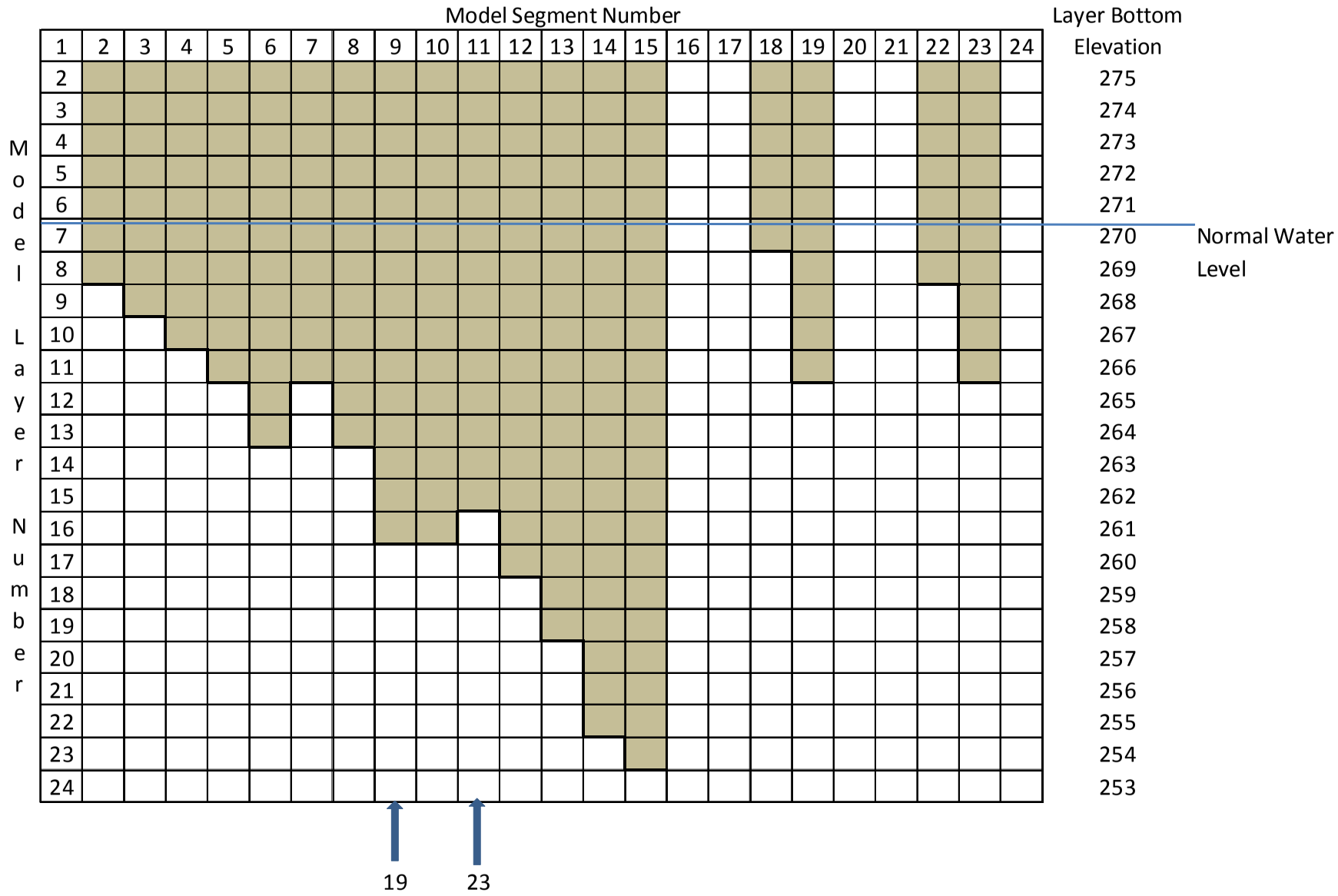


Figure 4-2 Inks Lake Model Longitudinal/Vertical Segmentation

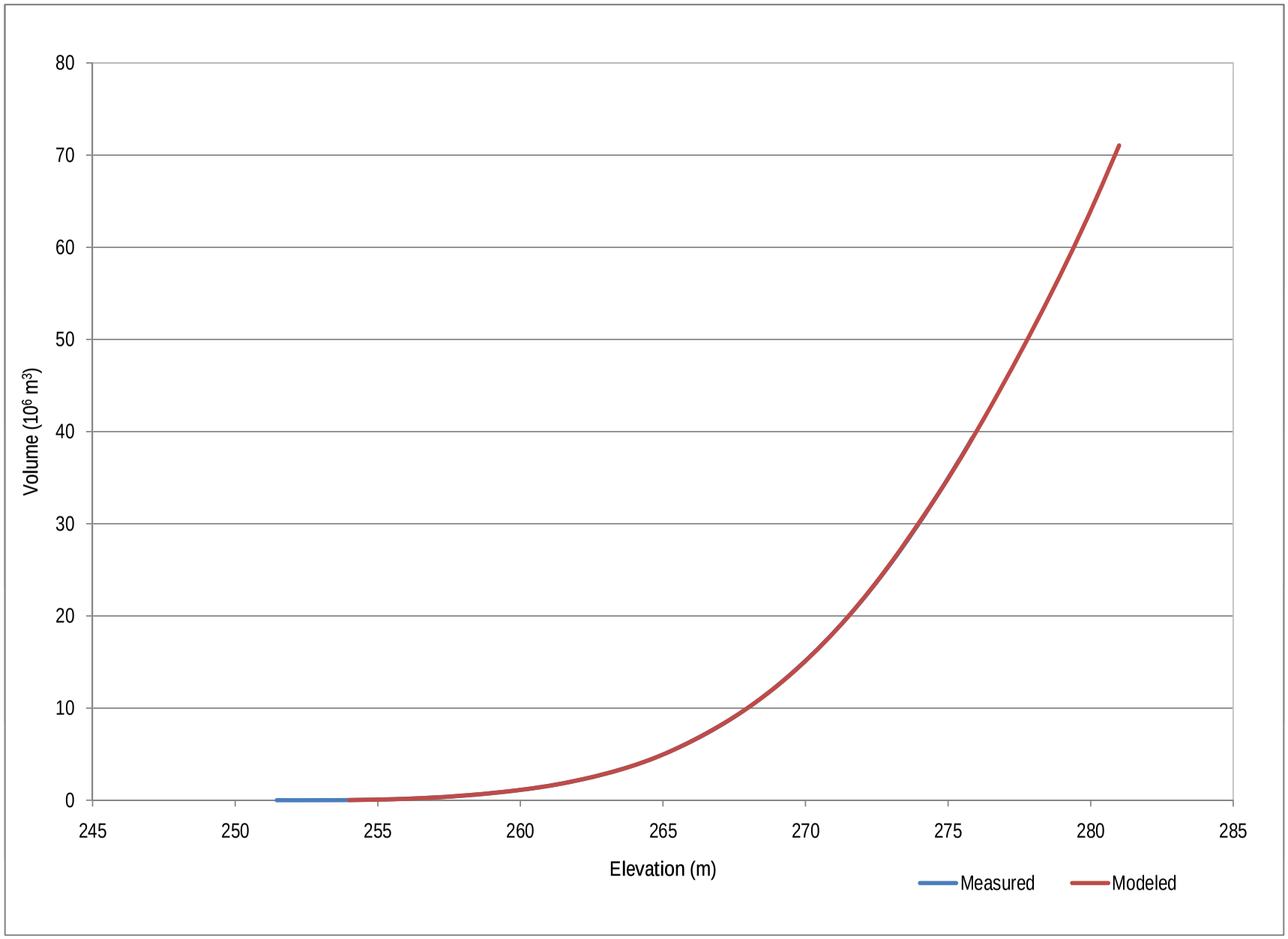
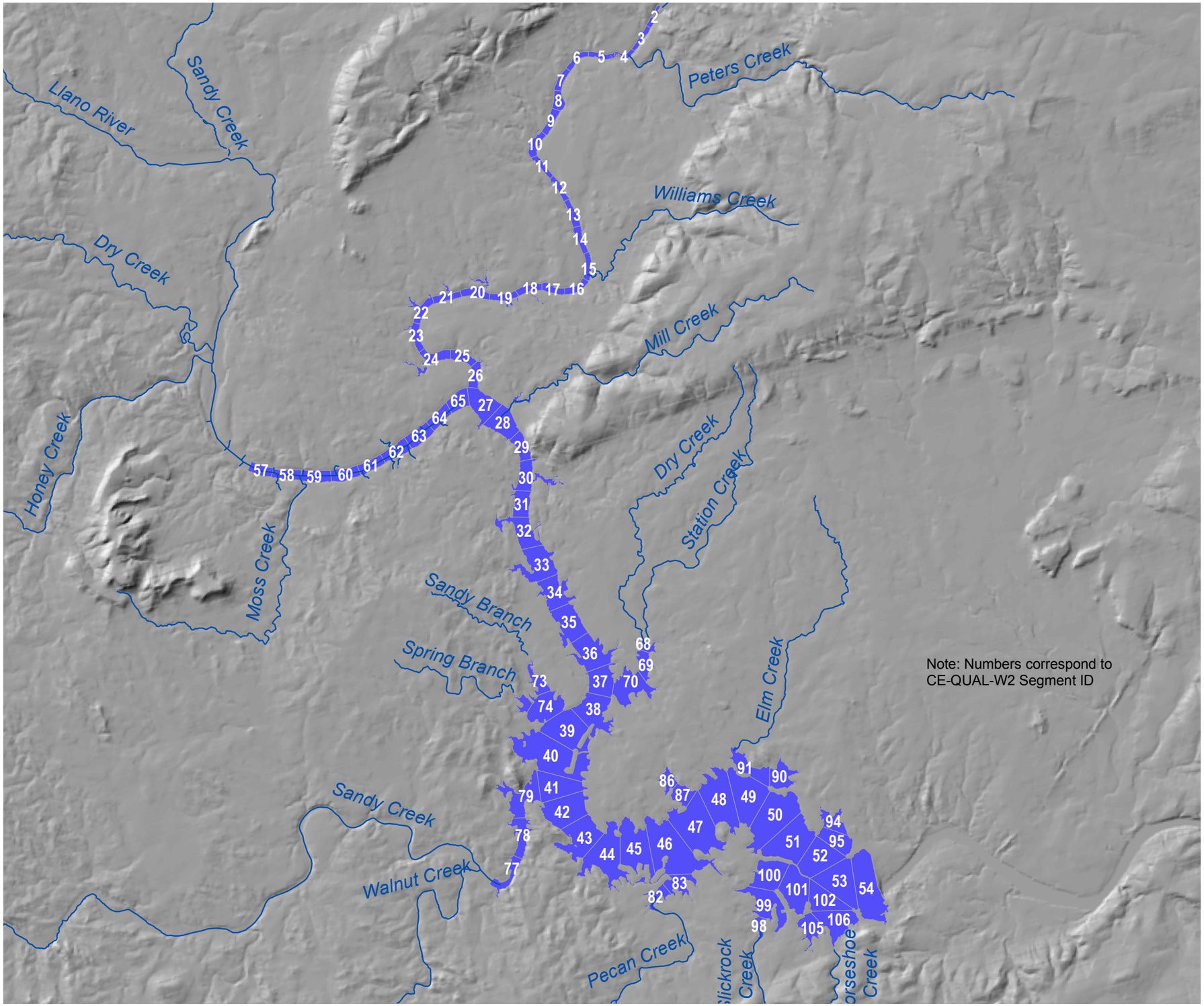
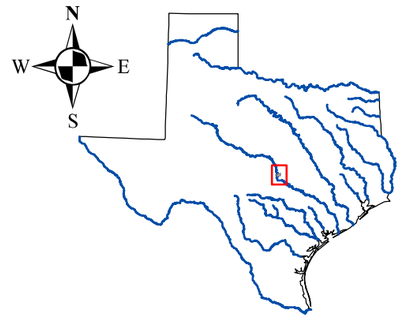


Figure 4-3 Elevation-volume Relationship for the Inks Lake Model





1 0.5 0 1 Miles

Legend

- Surface water
- Lake LBJ

Figure 4-4.

Lake LBJ CE-QUAL-W2 Model Segmentation

PARSONS

ANCHOR QEA

November 2010

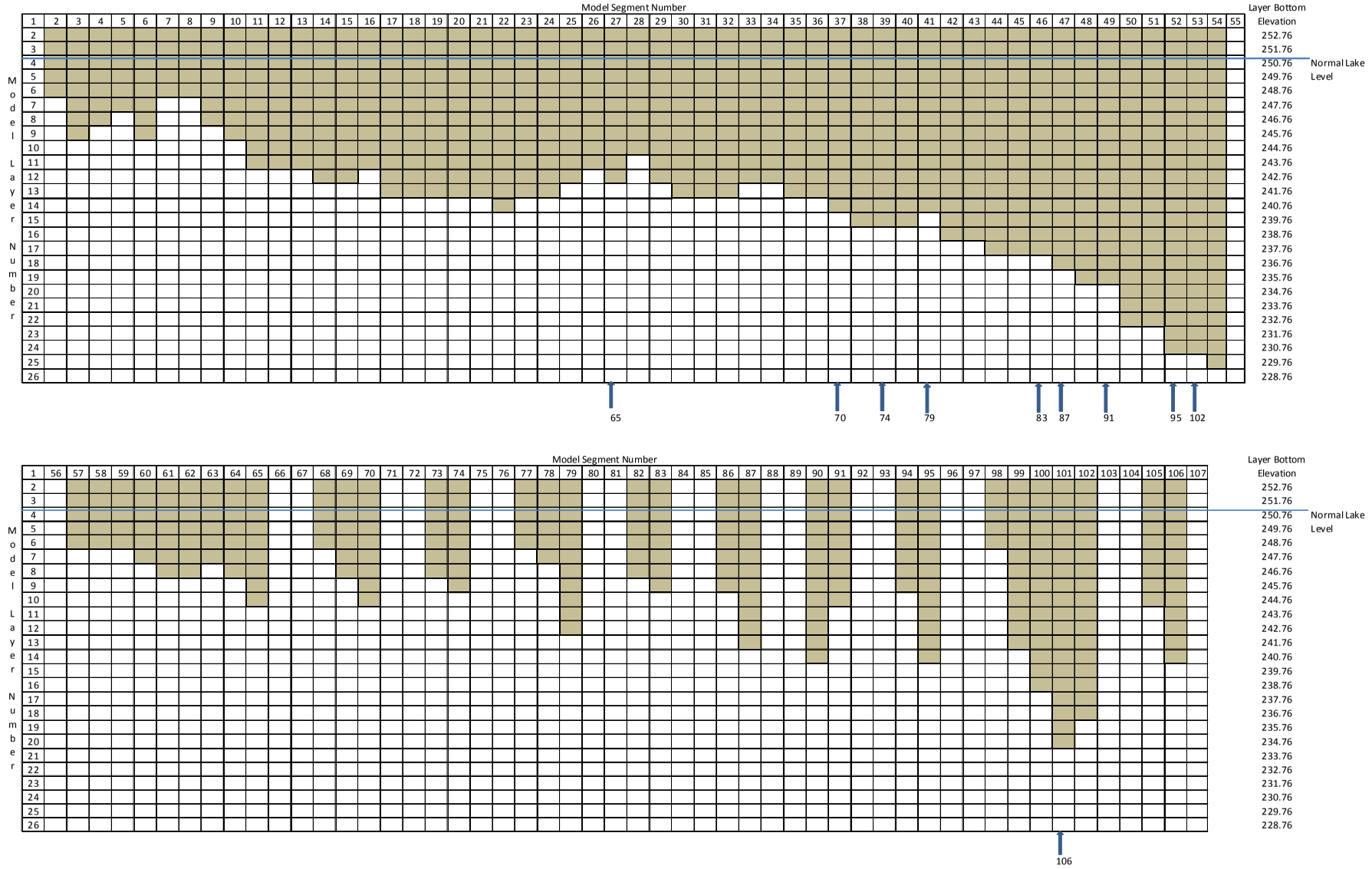


Figure 4-5 Lake LBJ Longitudinal/Vertical Segmentation.

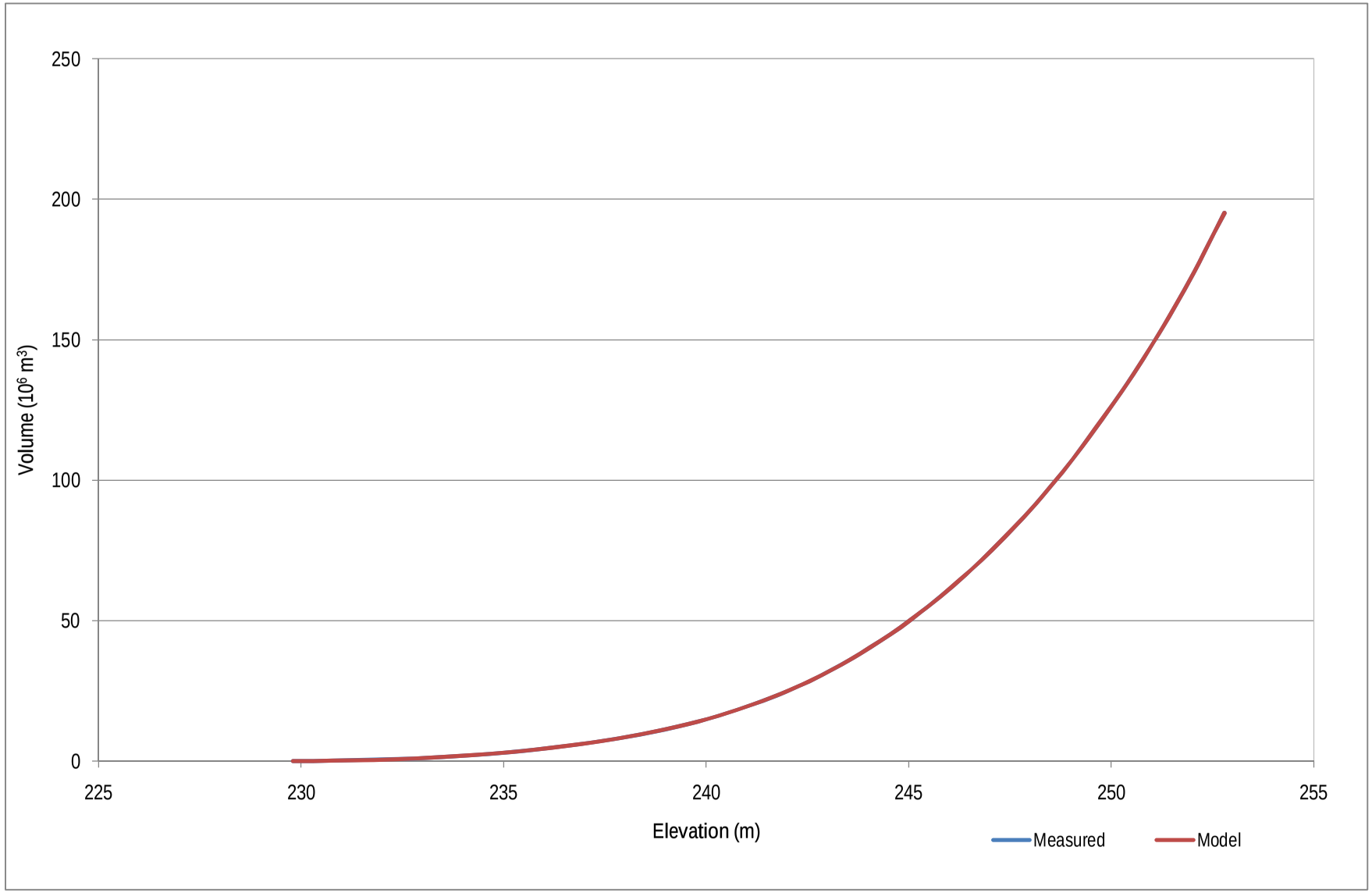
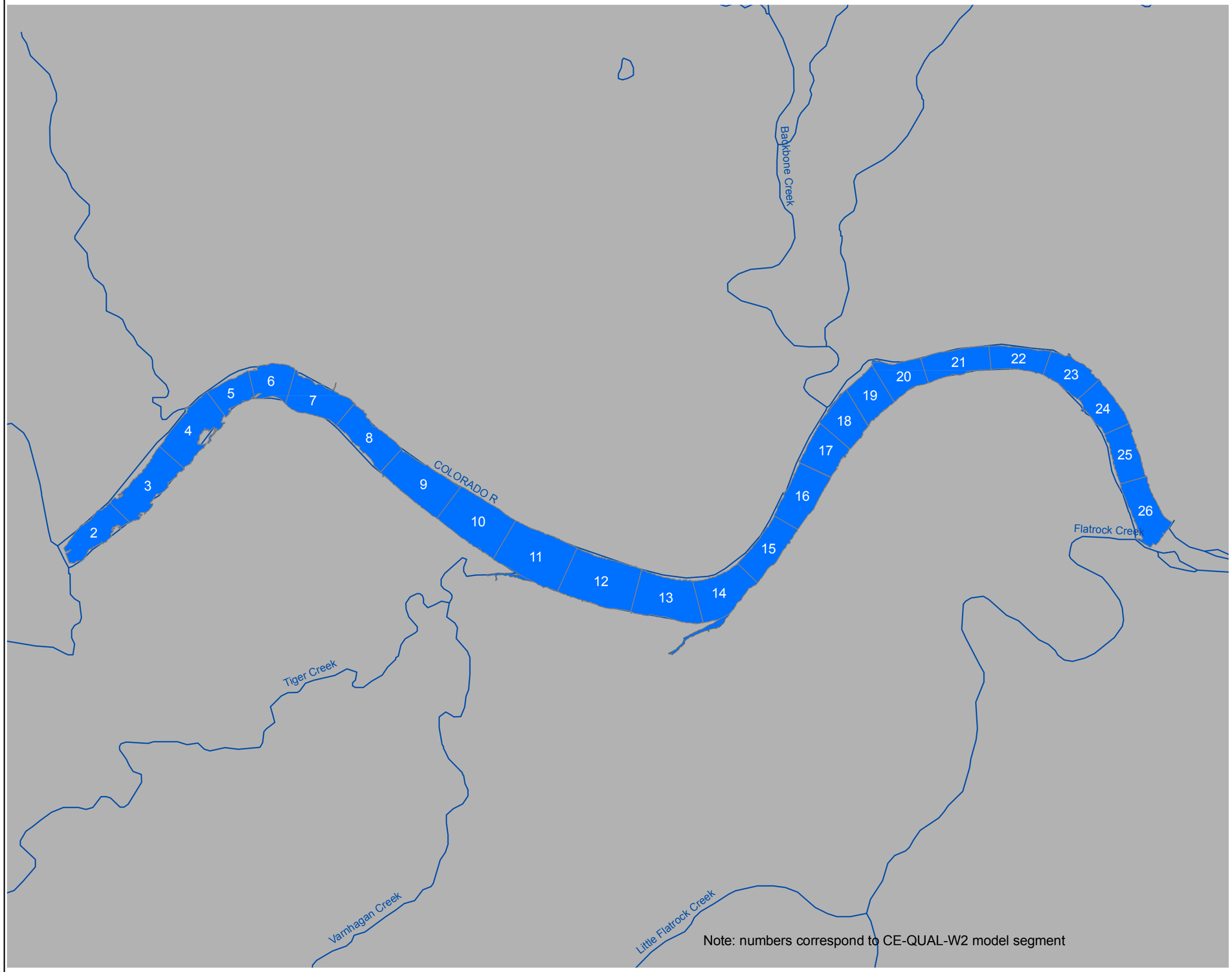
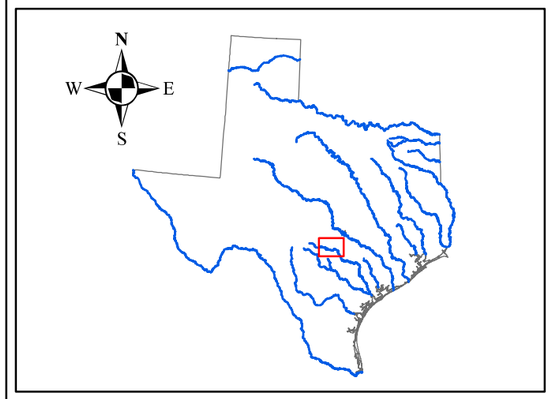


Figure 4-6 Elevation-volume Relationship for the Lake LBJ Model





0.5 0.25 0 0.5 Miles

Legend

- Marble Falls Lake Model Segment
- Surface Water

Figure 4-7.

Lake Marble Falls CE-QUAL-W2 Model Segmentation

LCRA ENERGY • WATER • COMMUNITY SERVICES

PARSONS ANCHOR QEA

November 2010

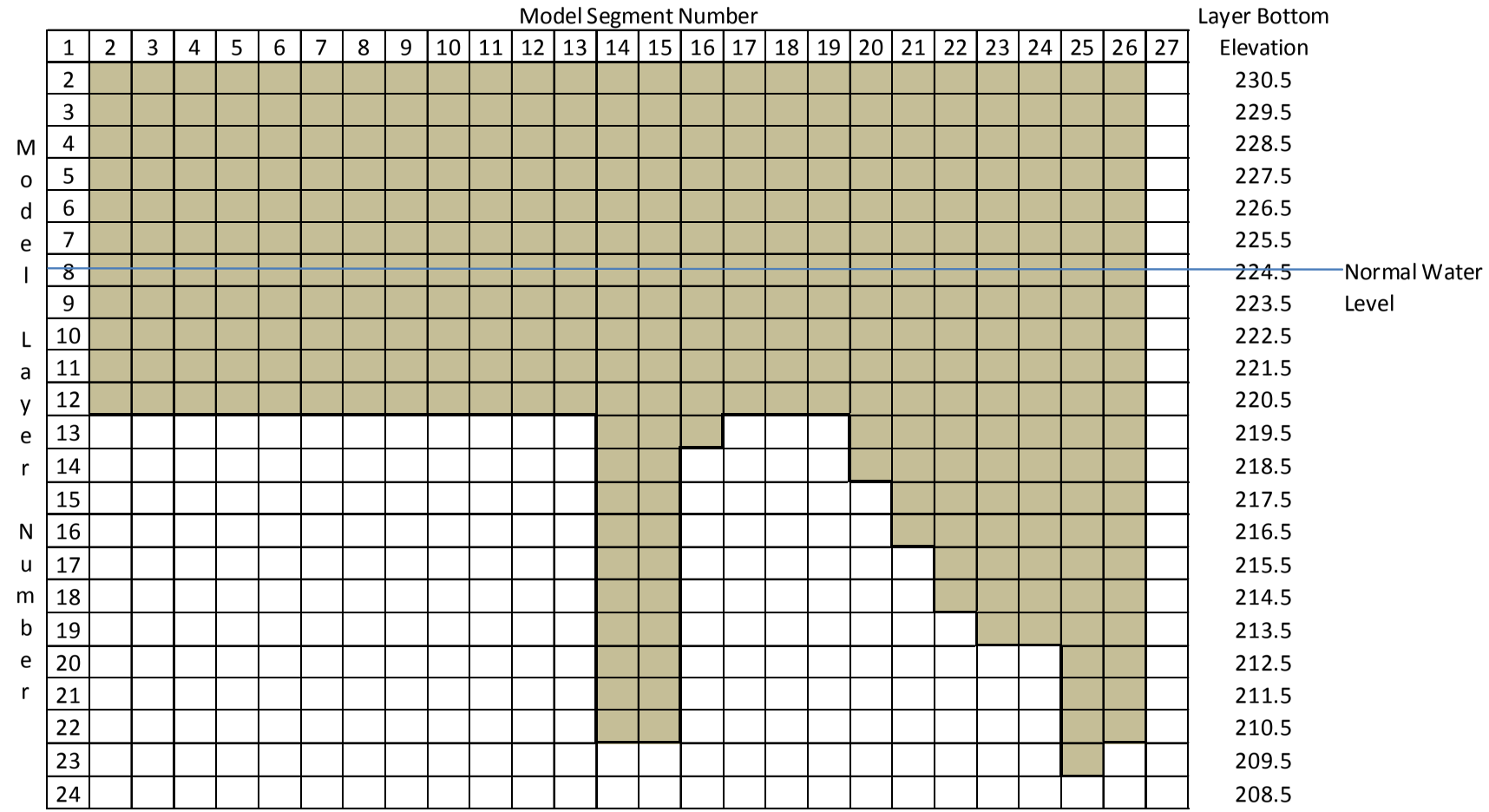


Figure 4-8 Longitudinal Profile of Lake Marble Falls Model

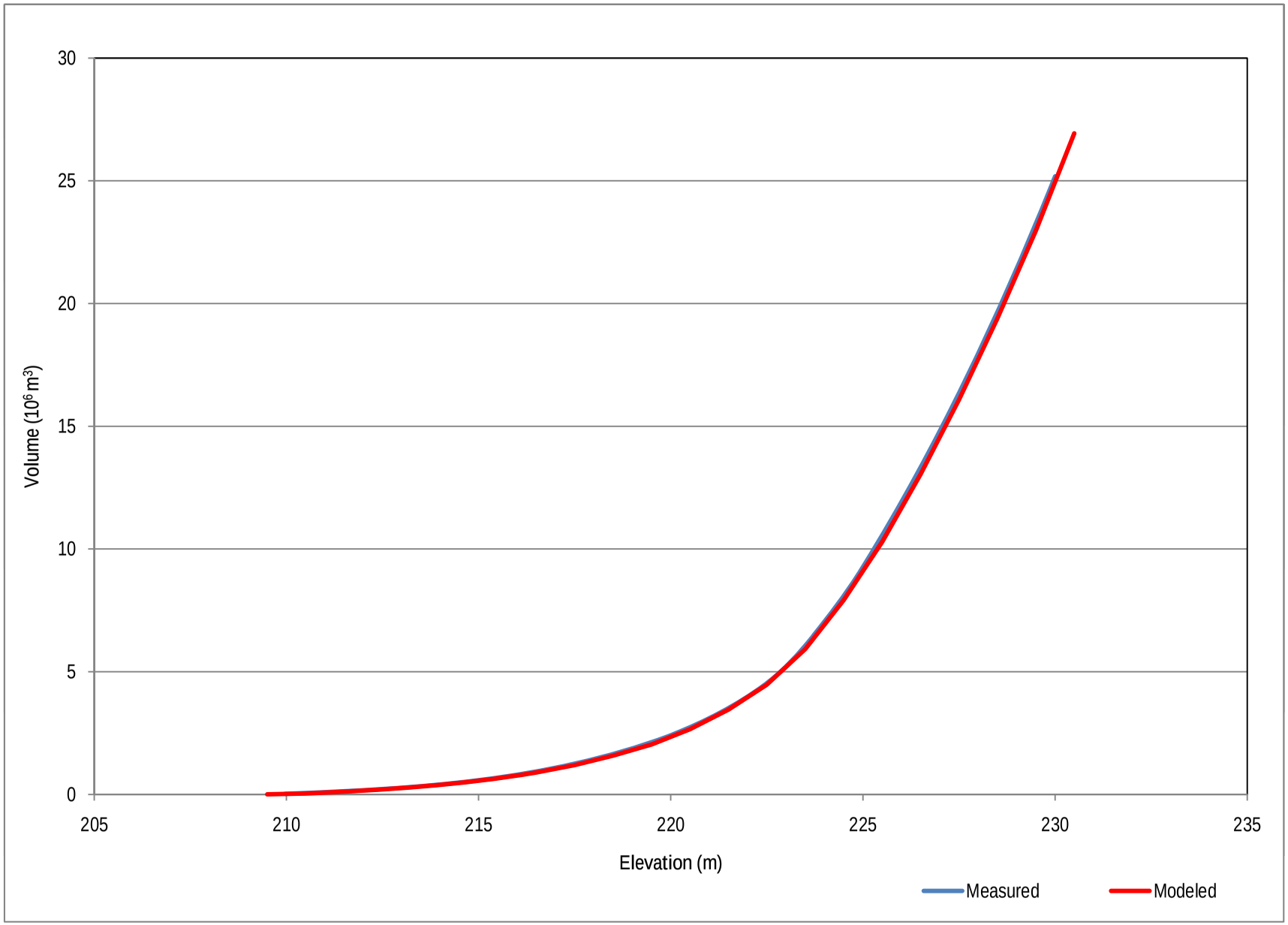


Figure 4-9 Elevation-volume Relationship for the Lake Marble Falls Model

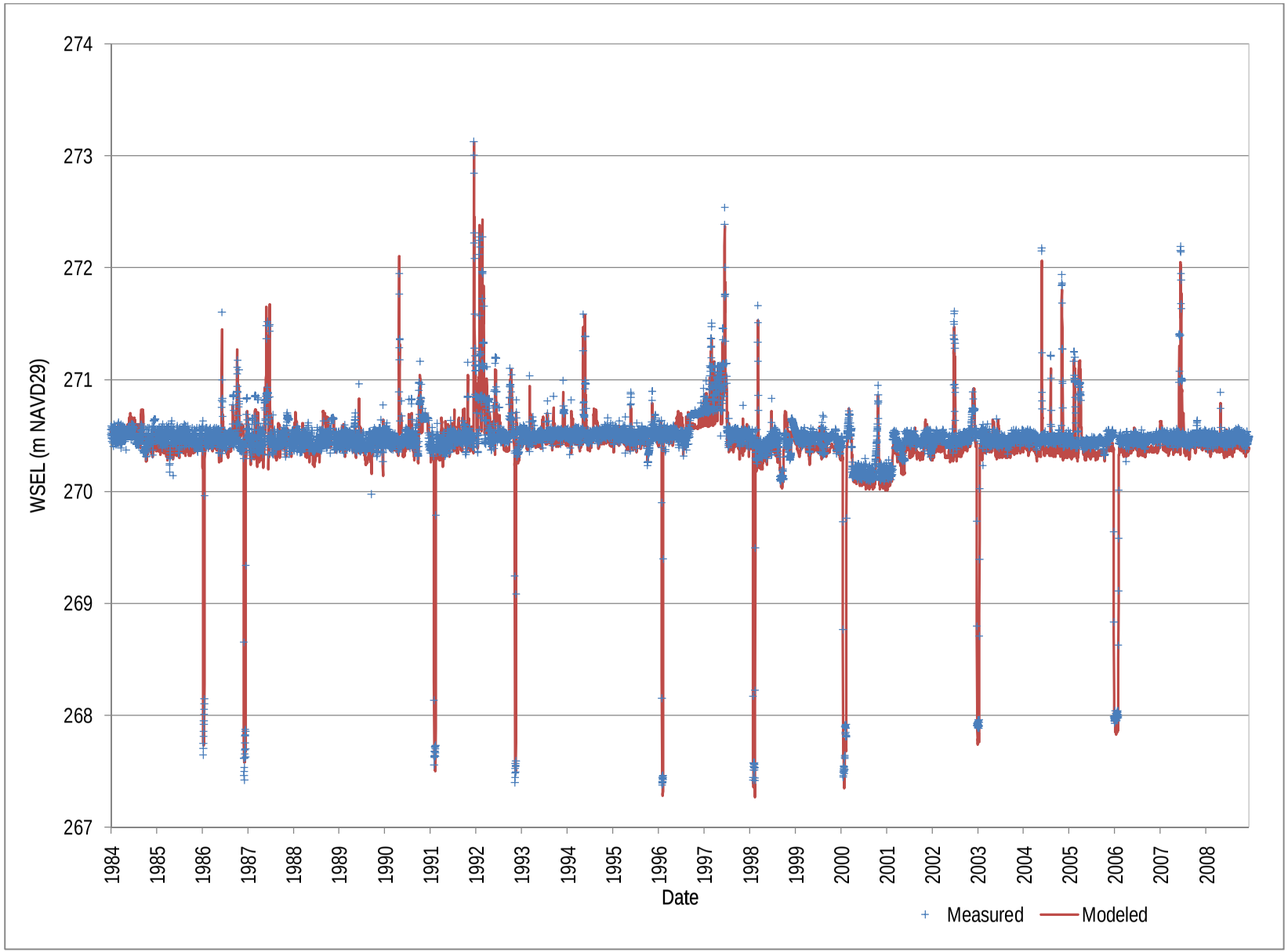


Figure 4-10 Water Level Calibration Results for the Inks Lake Model

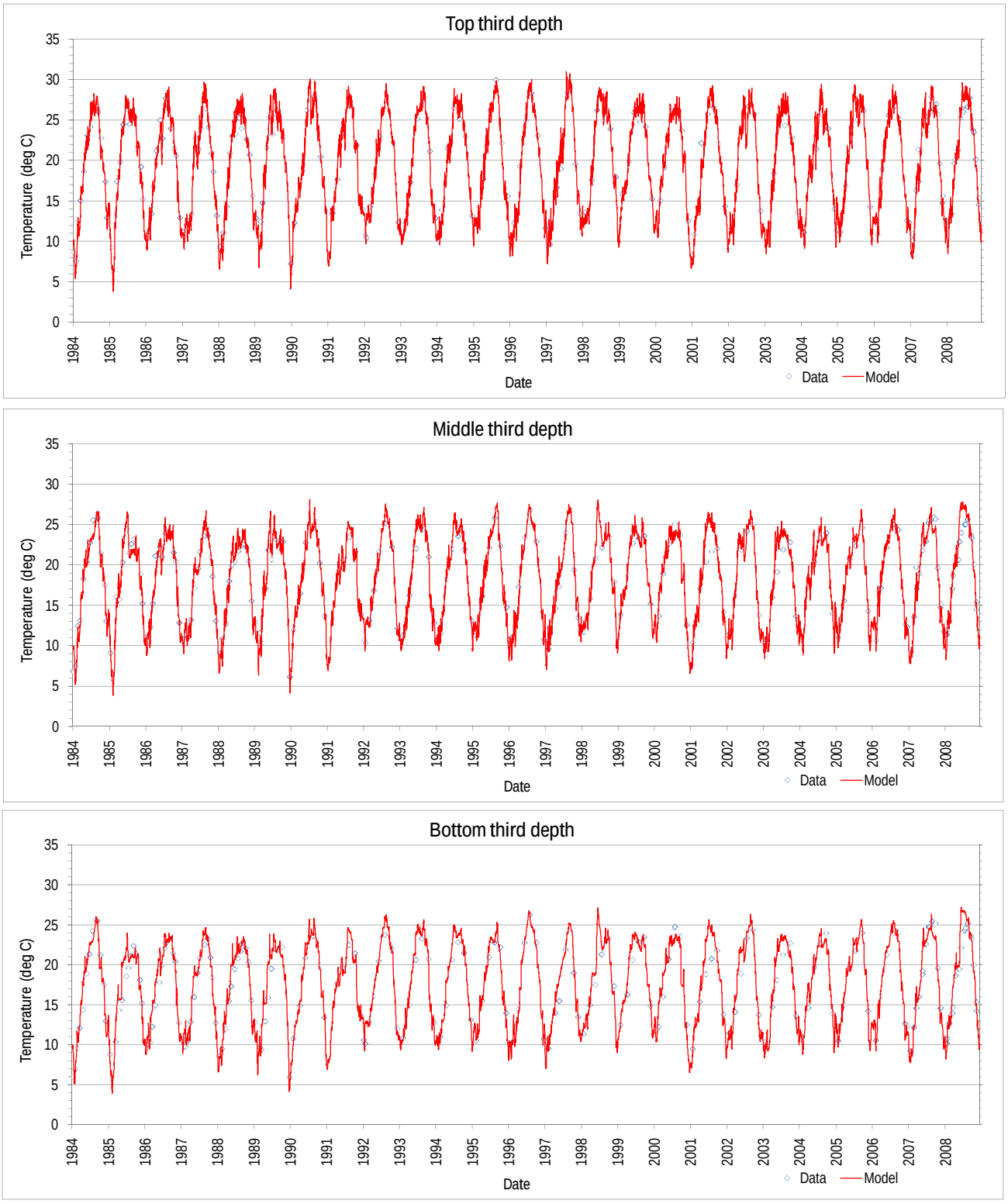


Figure 4-11 Temporal of Model versus Data for Inks Lake at Inks Dam (Segment 15) - Temperature

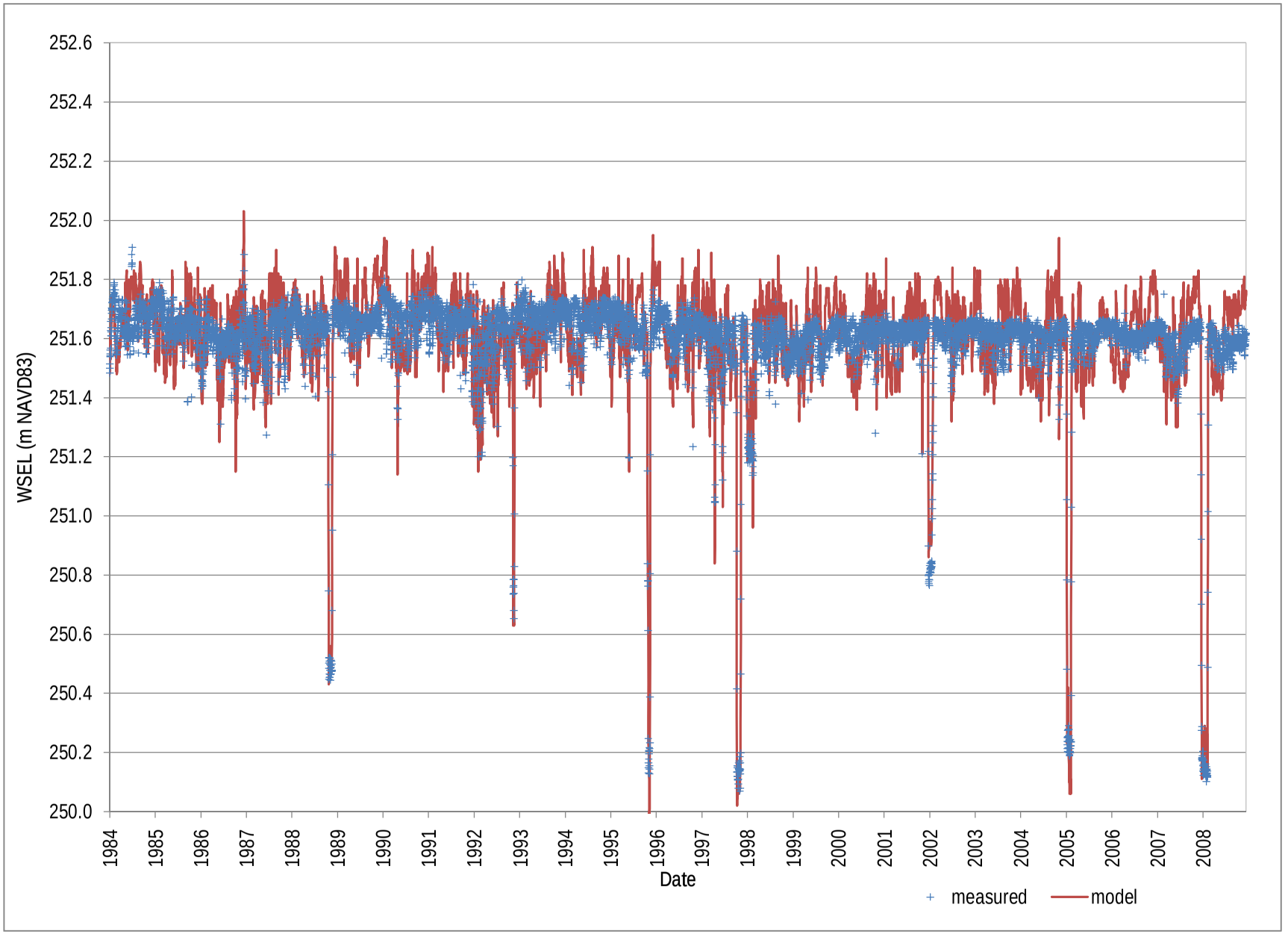


Figure 4-12 Water Level Calibration Results for the Lake LBJ Model

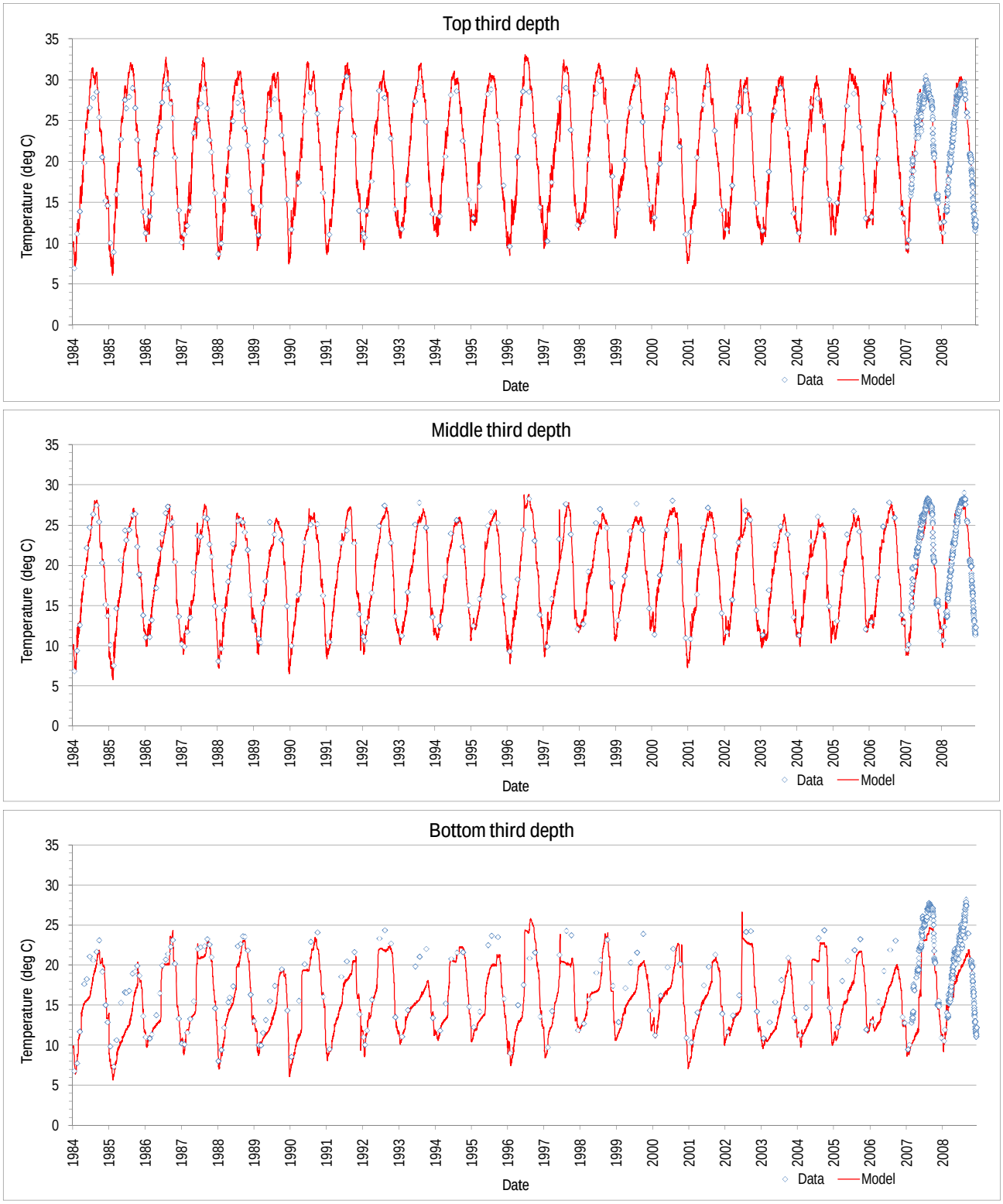


Figure 4-13 Temporal of Model versus Data for LBJ near Alvin Wirtz Dam (Segment 54) - Temperature

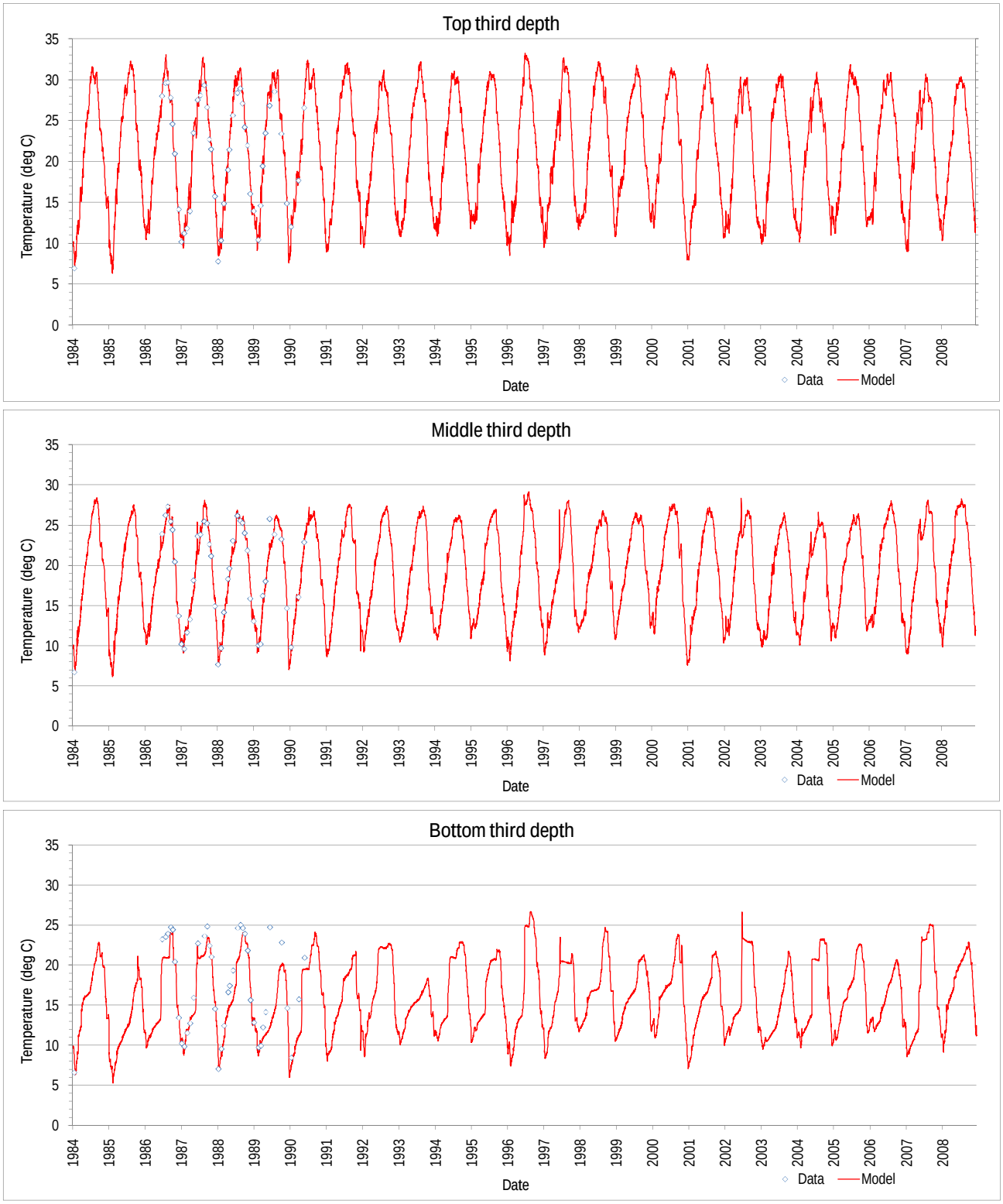


Figure 4-14 Temporal of Model versus Data for LBJ at the Narrows (Segment 53) - Temperature

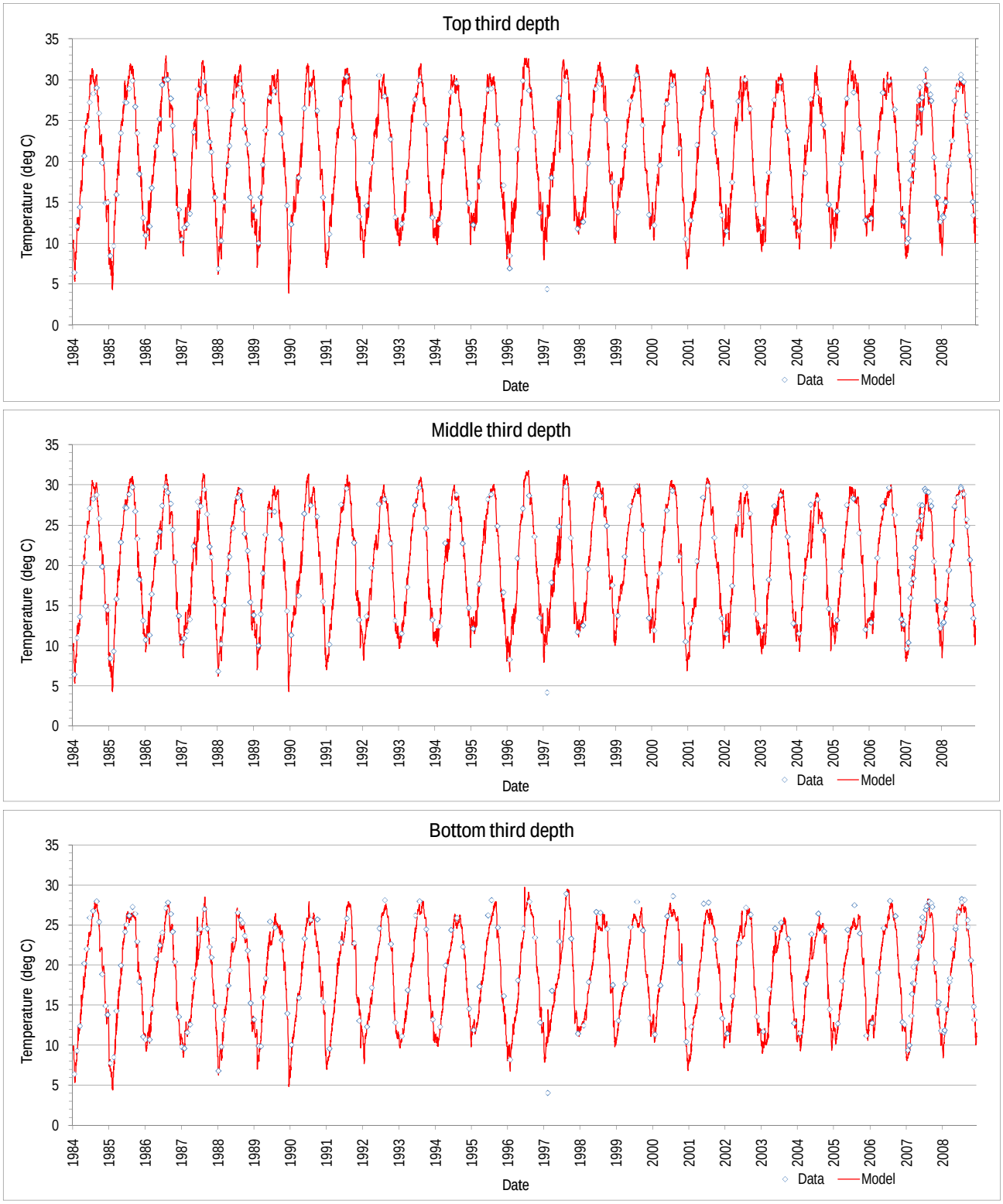


Figure 4-15 Temporal of Model versus Data for LBJ at Confluence with Sandy Creek Arm (Segment 41) - Temperature

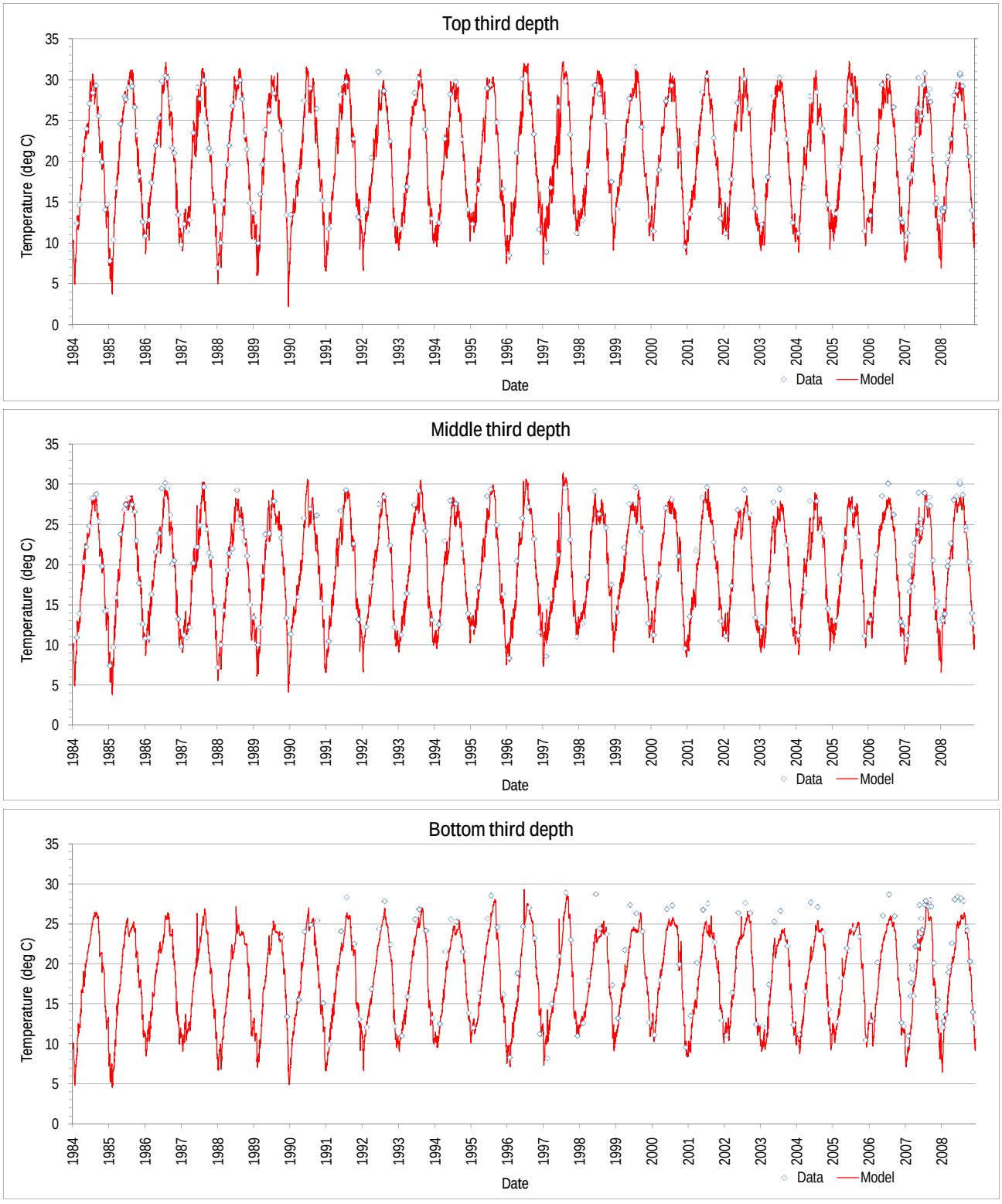


Figure 4-16 Temporal of Model versus Data for LBJ at Confluence with Llano River Arm (Segment 30) - Temperature

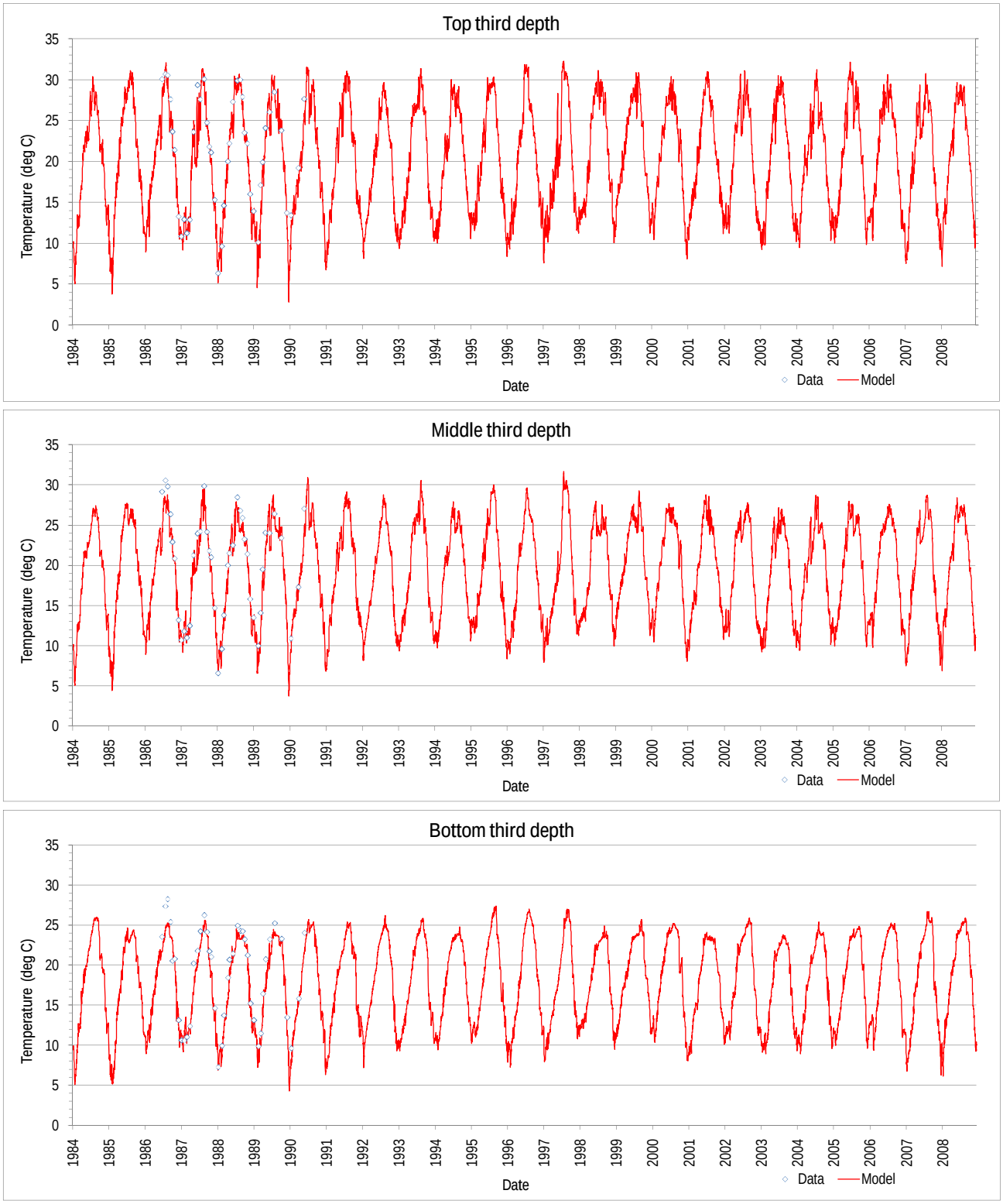


Figure 4-17 Temporal of Model versus Data for LBJ at FM 1431 (Segment 26) - Temperature

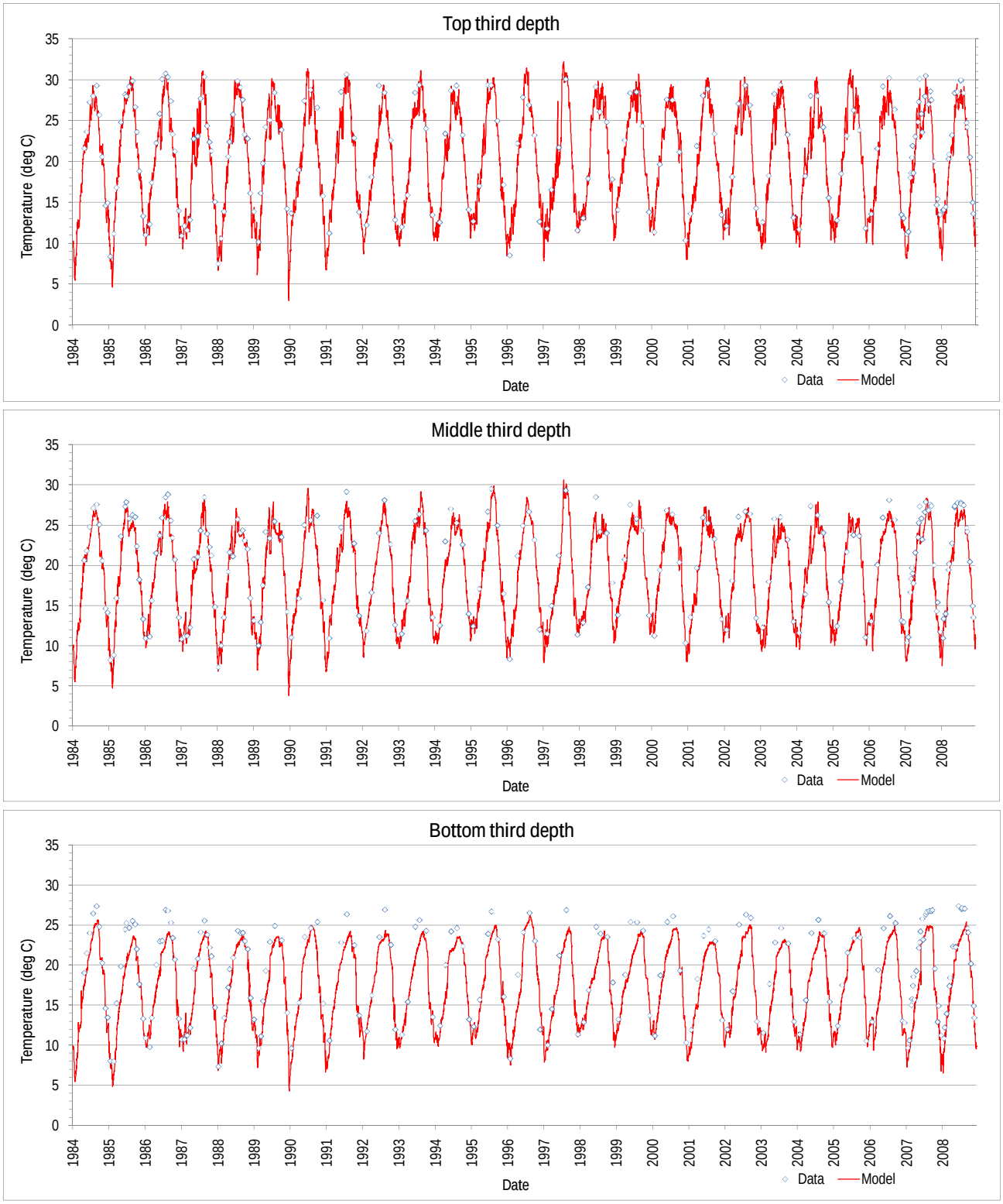


Figure 4-18 Temporal of Model versus Data for LBJ at Kingsland Cove (Segment 24) - Temperature

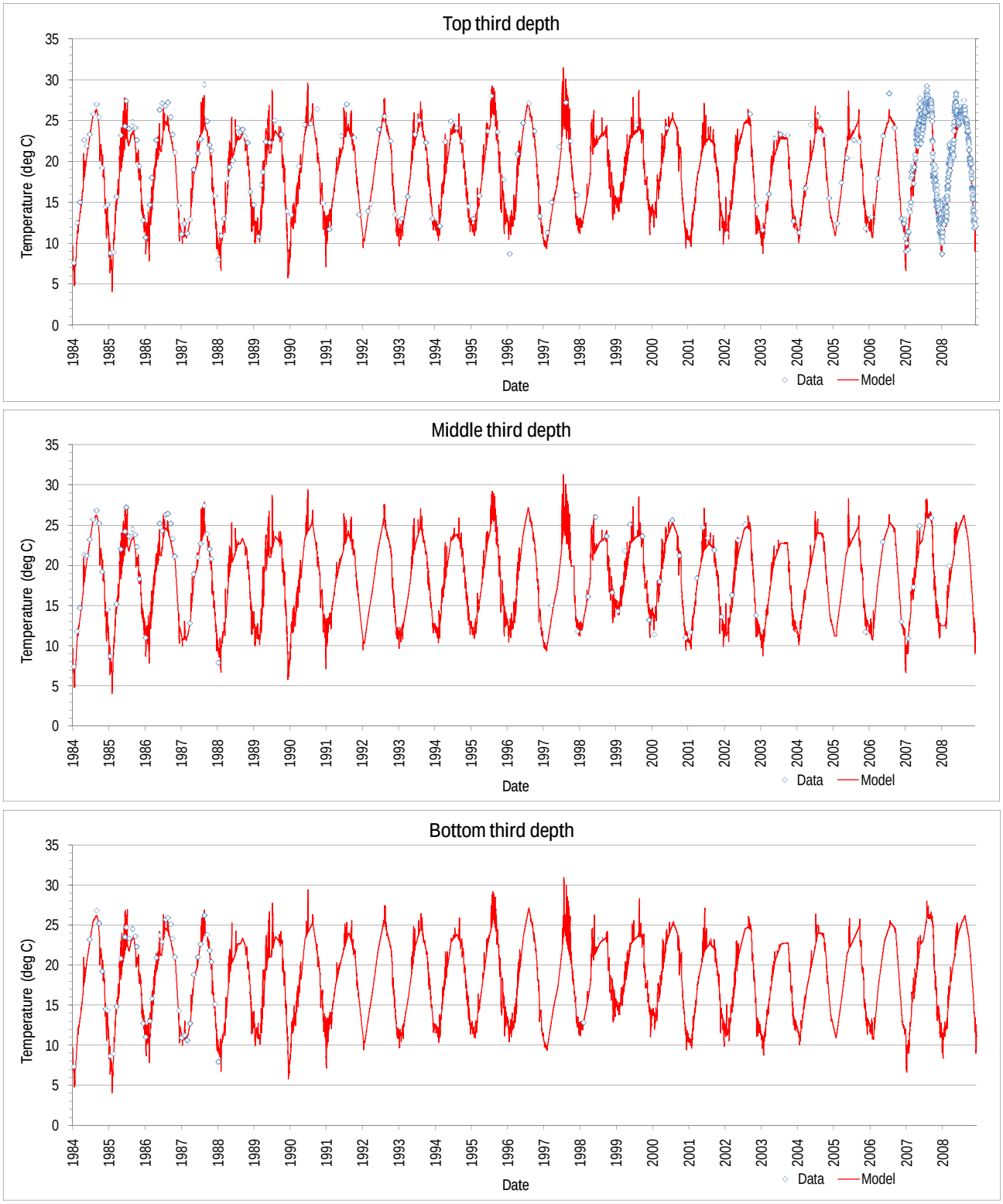


Figure 4-19 Temporal of Model versus Data for LBJ at Headwaters (Segment 2) - Temperature

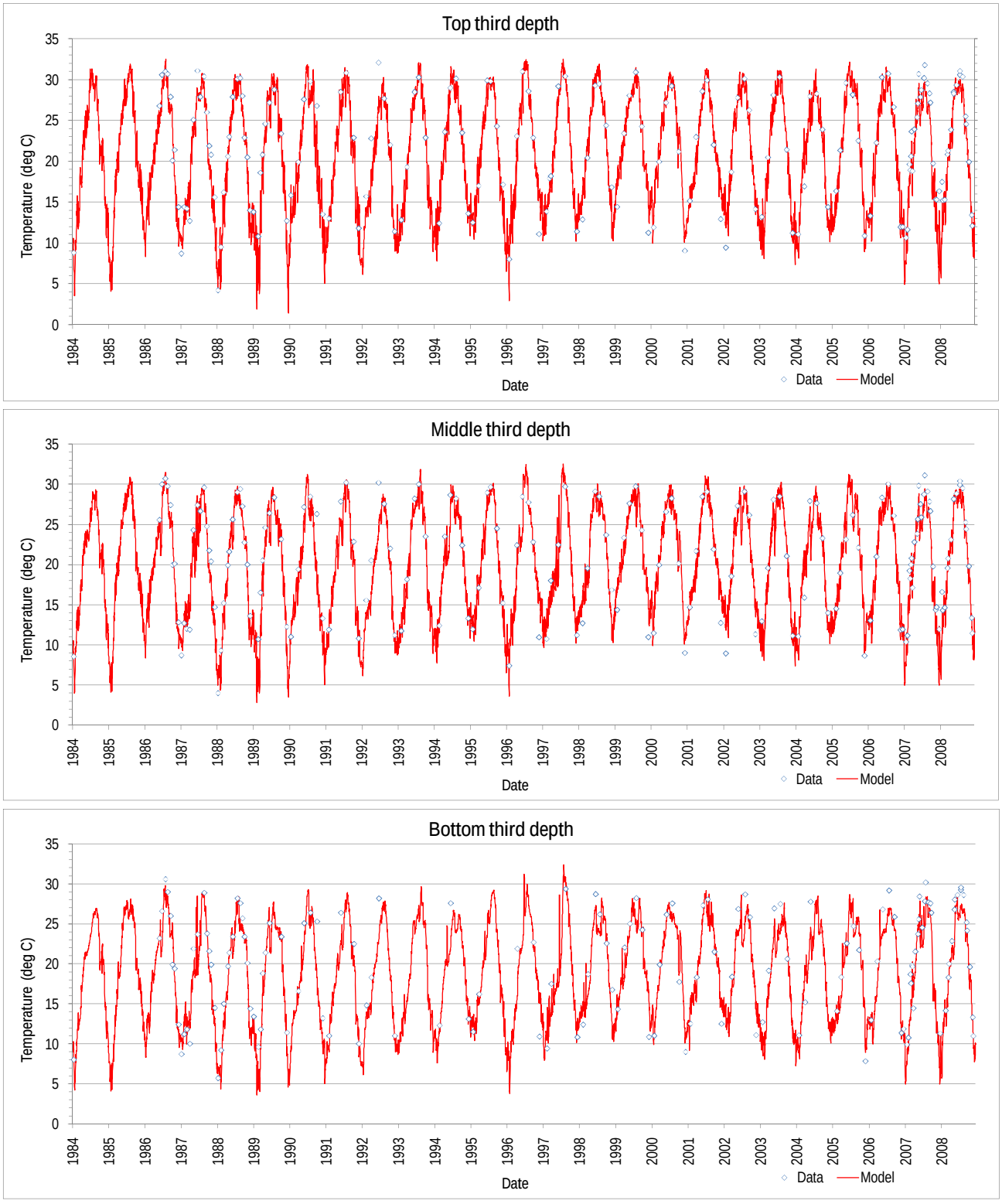


Figure 4-20 Temporal of Model versus Data for LBJ at FM 2900 (Segment 62) - Temperature

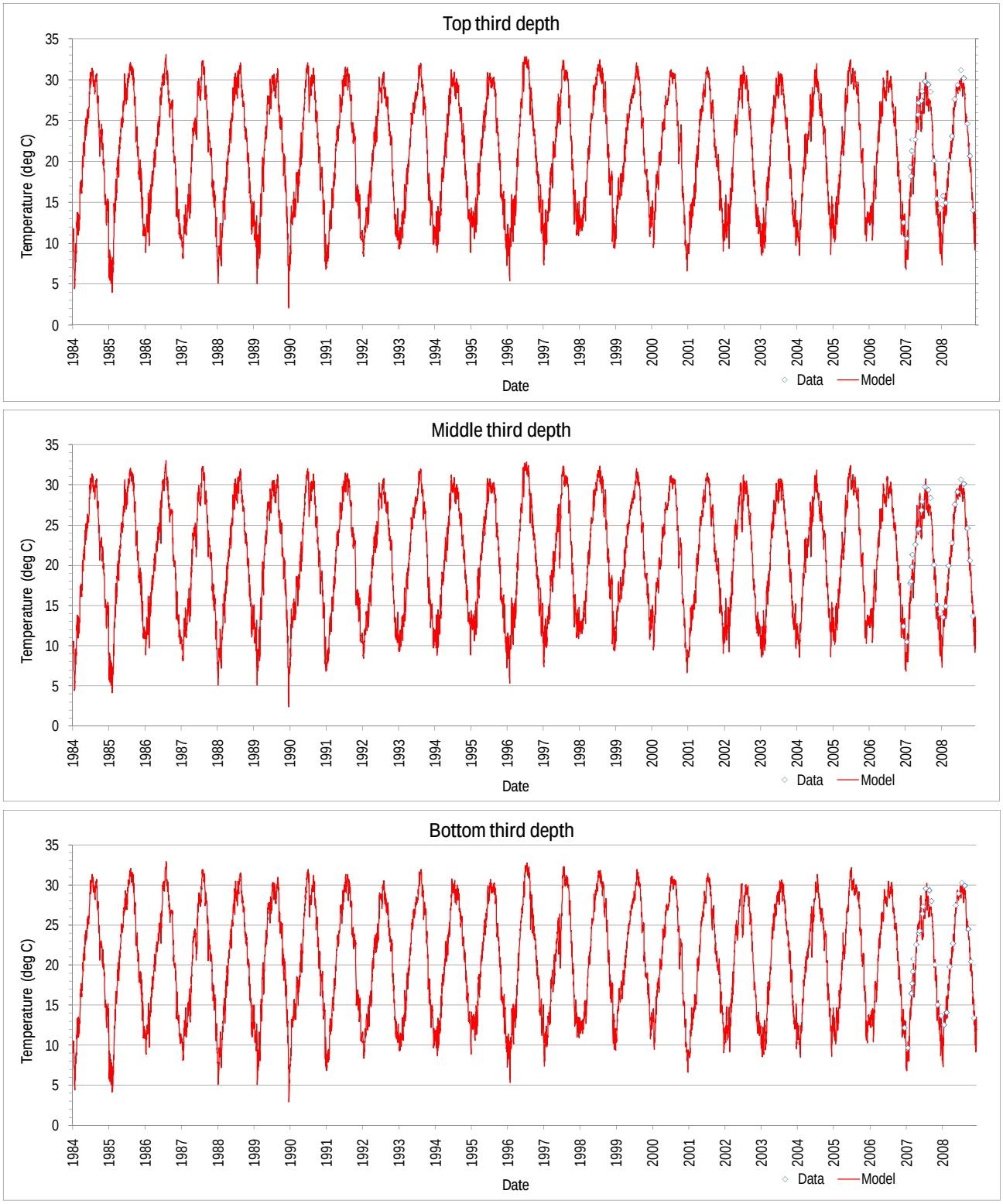


Figure 4-21 Temporal of Model versus Data for LBJ near Lake Shore Drive (Segment 78) - Temperature

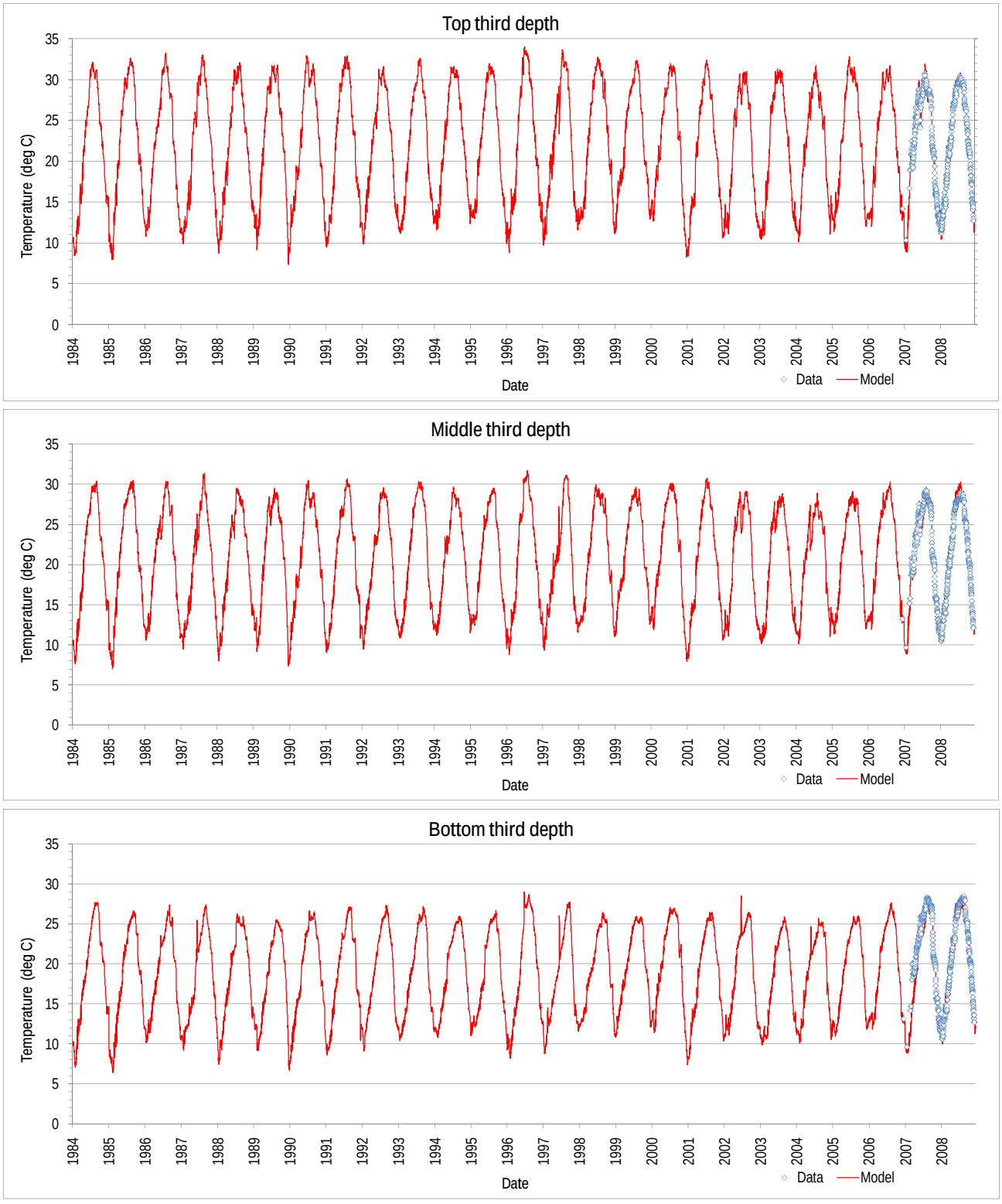


Figure 4-22 Temporal of Model versus Data for LBJ at Horseshoe Bay Cove (Segment 100) - Temperature

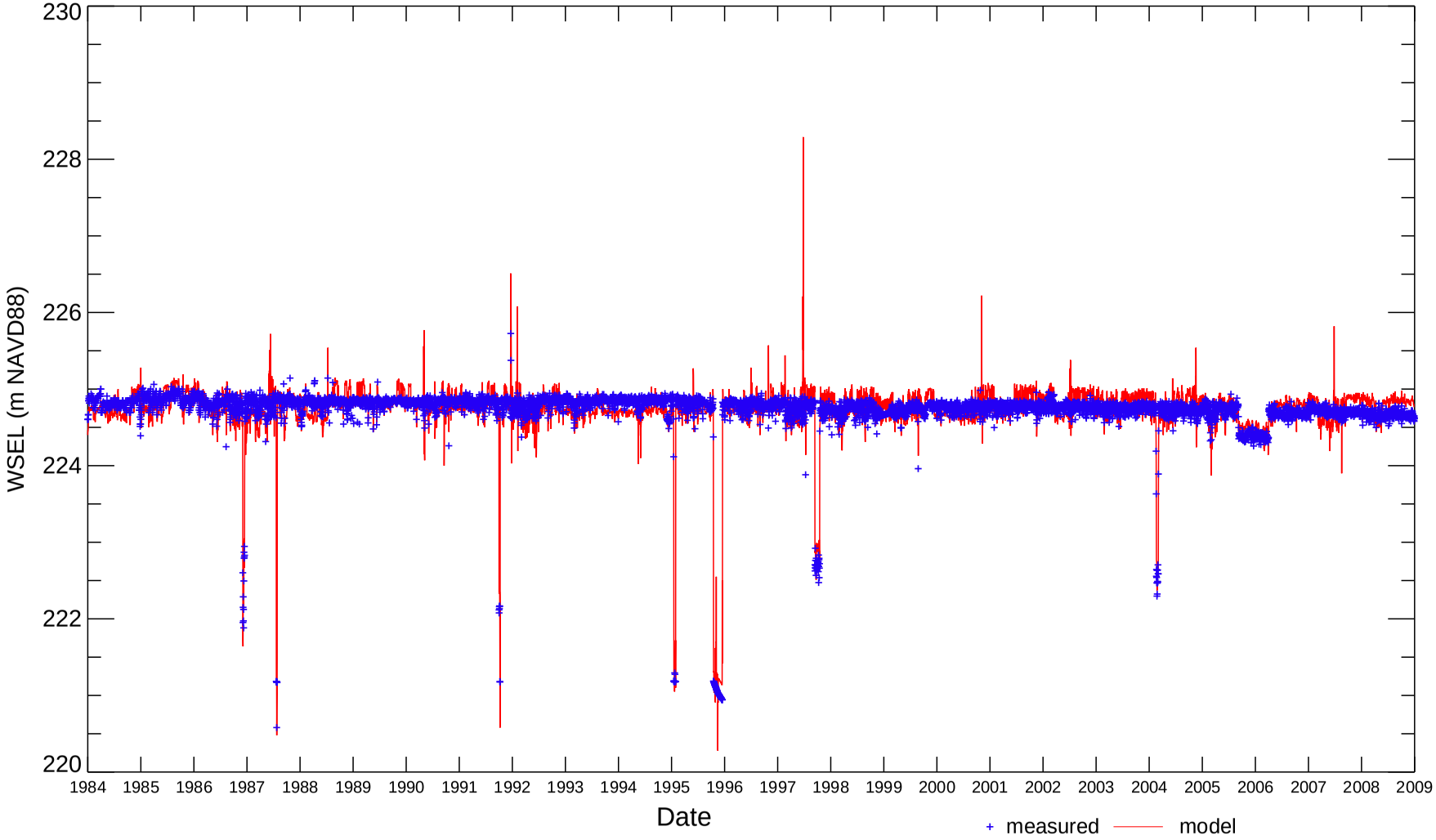


Figure 4-23 Daily Predicted and Measured Water Surface Elevations at Max Starcke Dam

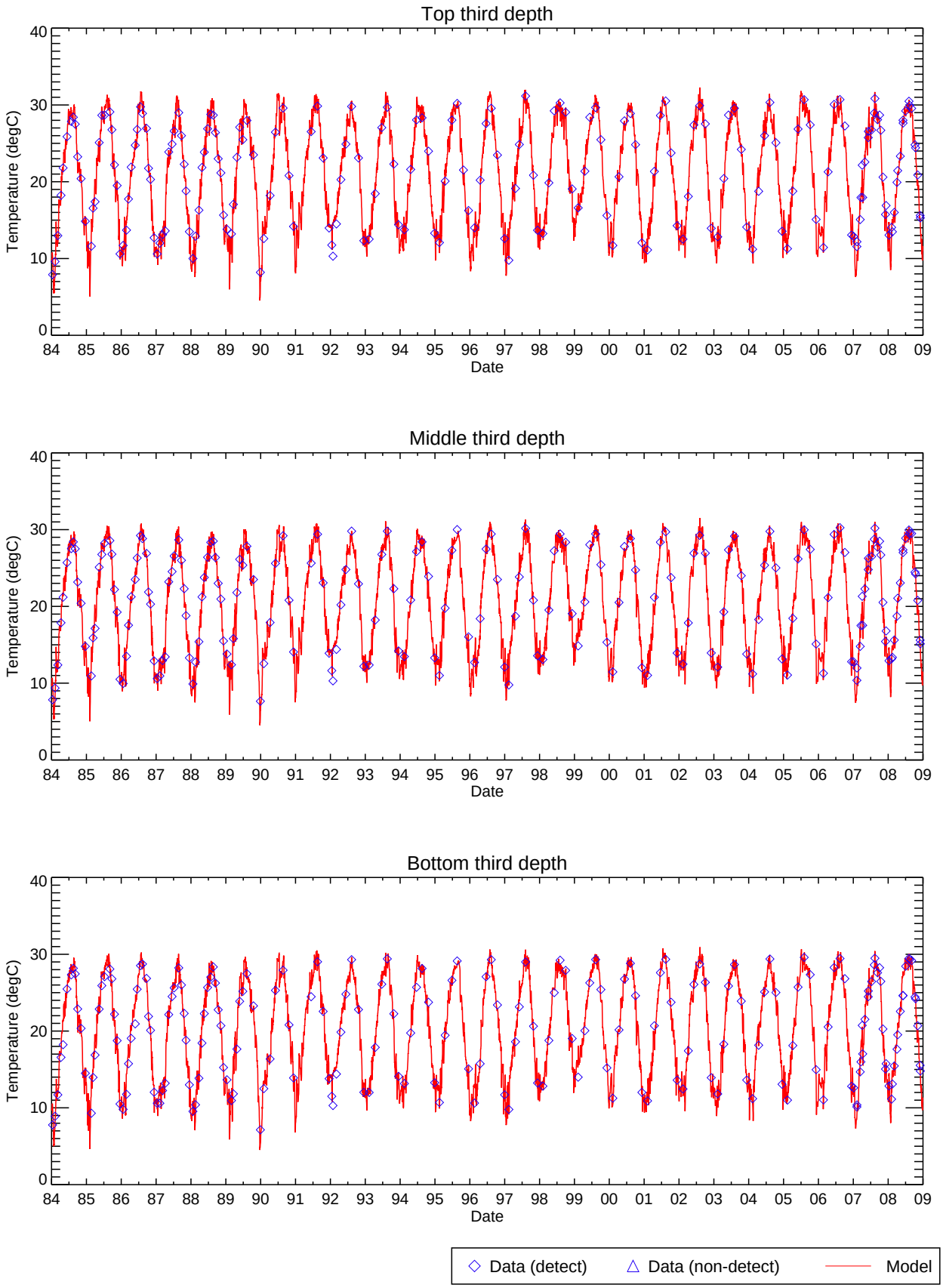


Figure 4-24 Temporal of Model versus Data for Lake Marble Falls near Max Starcke Dam (Segment 26) - Temperature

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth

Non-detects plotted at detection limit

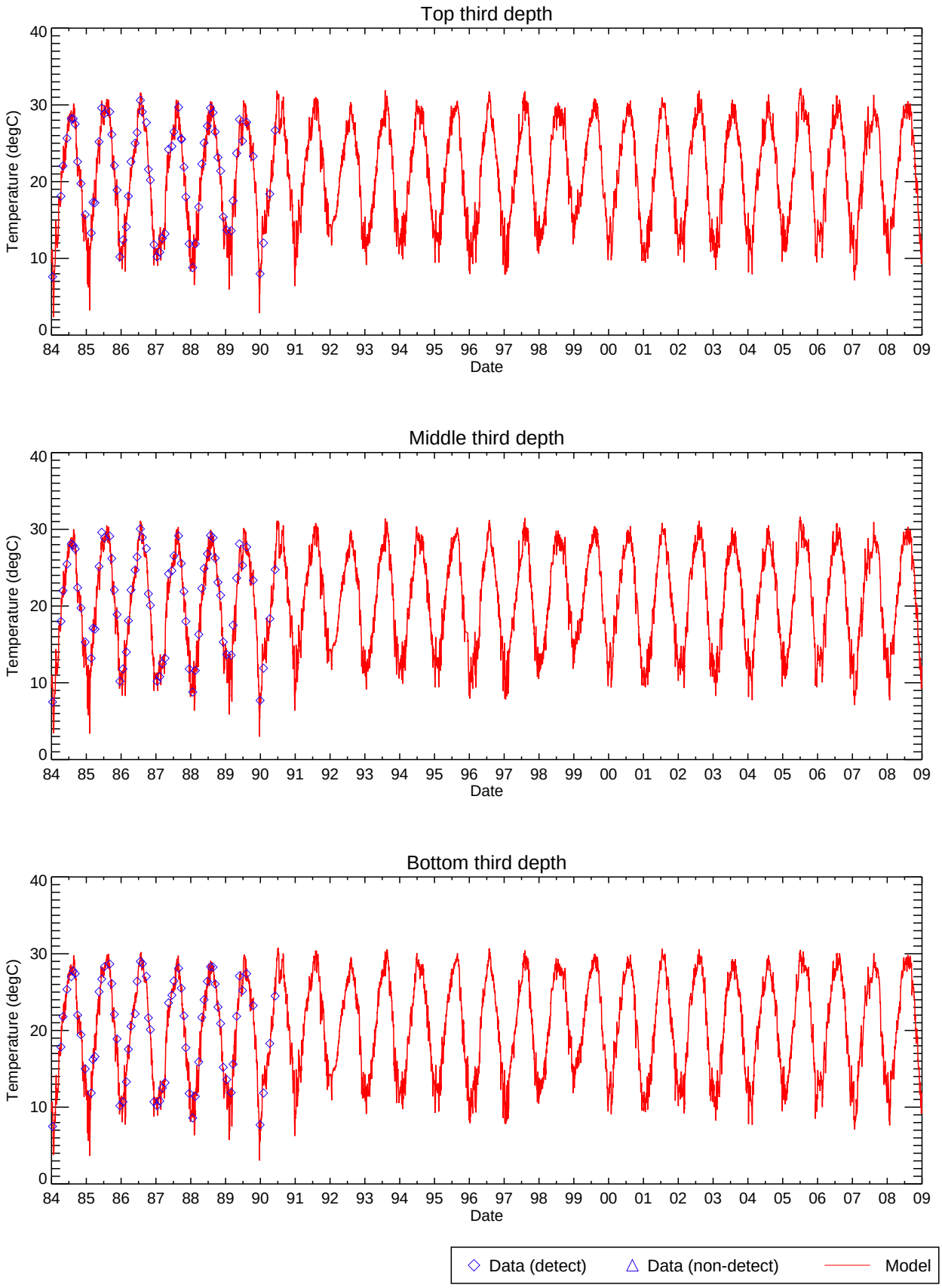


Figure 4-25 Temporal of Model versus Data for Lake Marble Falls near US 281 Bridge (Segment 20) - Temperature

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth

Non-detects plotted at detection limit

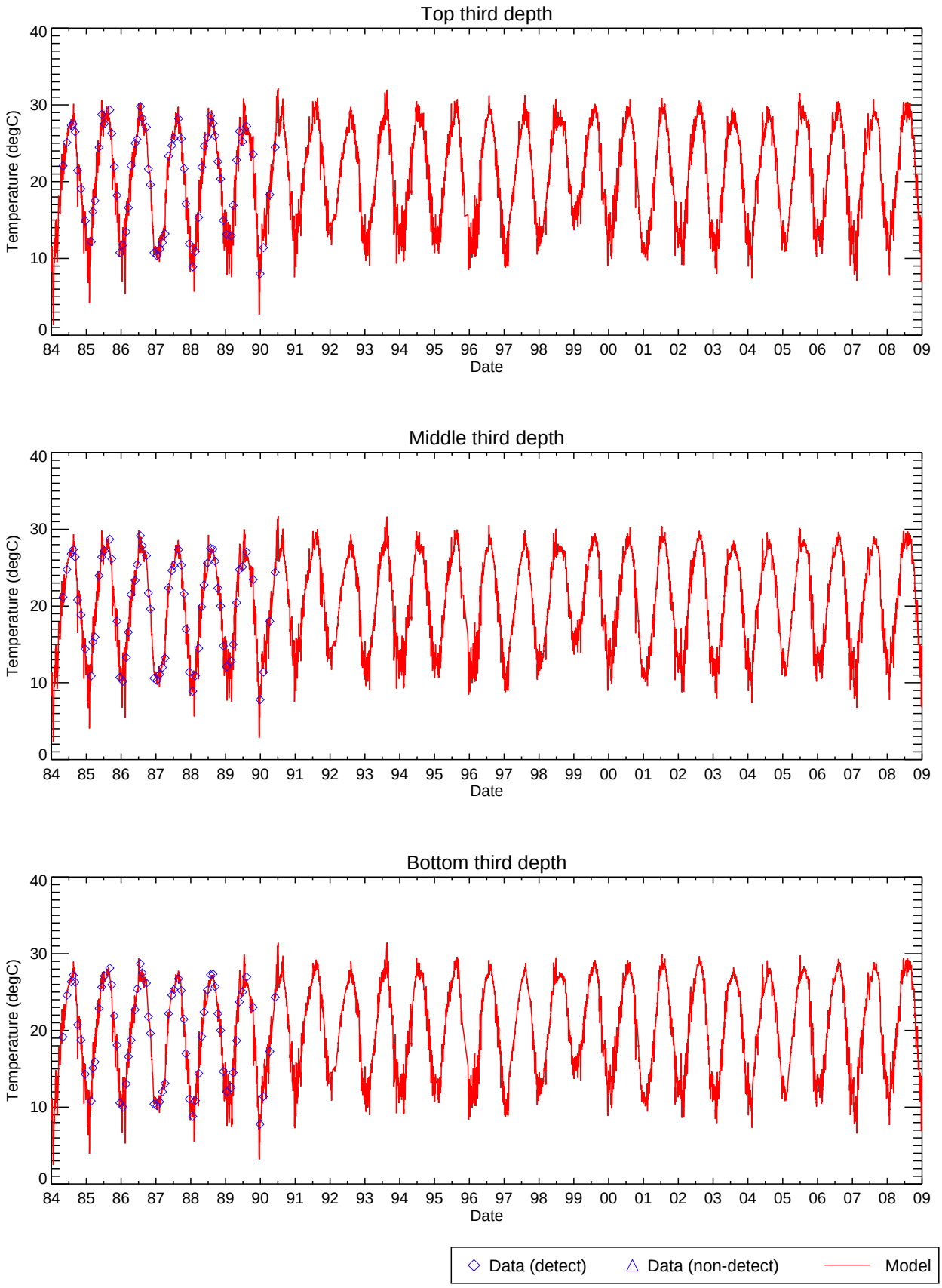


Figure 4-26 Temporal of Model versus Data for Lake Marble Falls at Hefner Ranch (Segment 11) - Temperature

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth

Non-detects plotted at detection limit

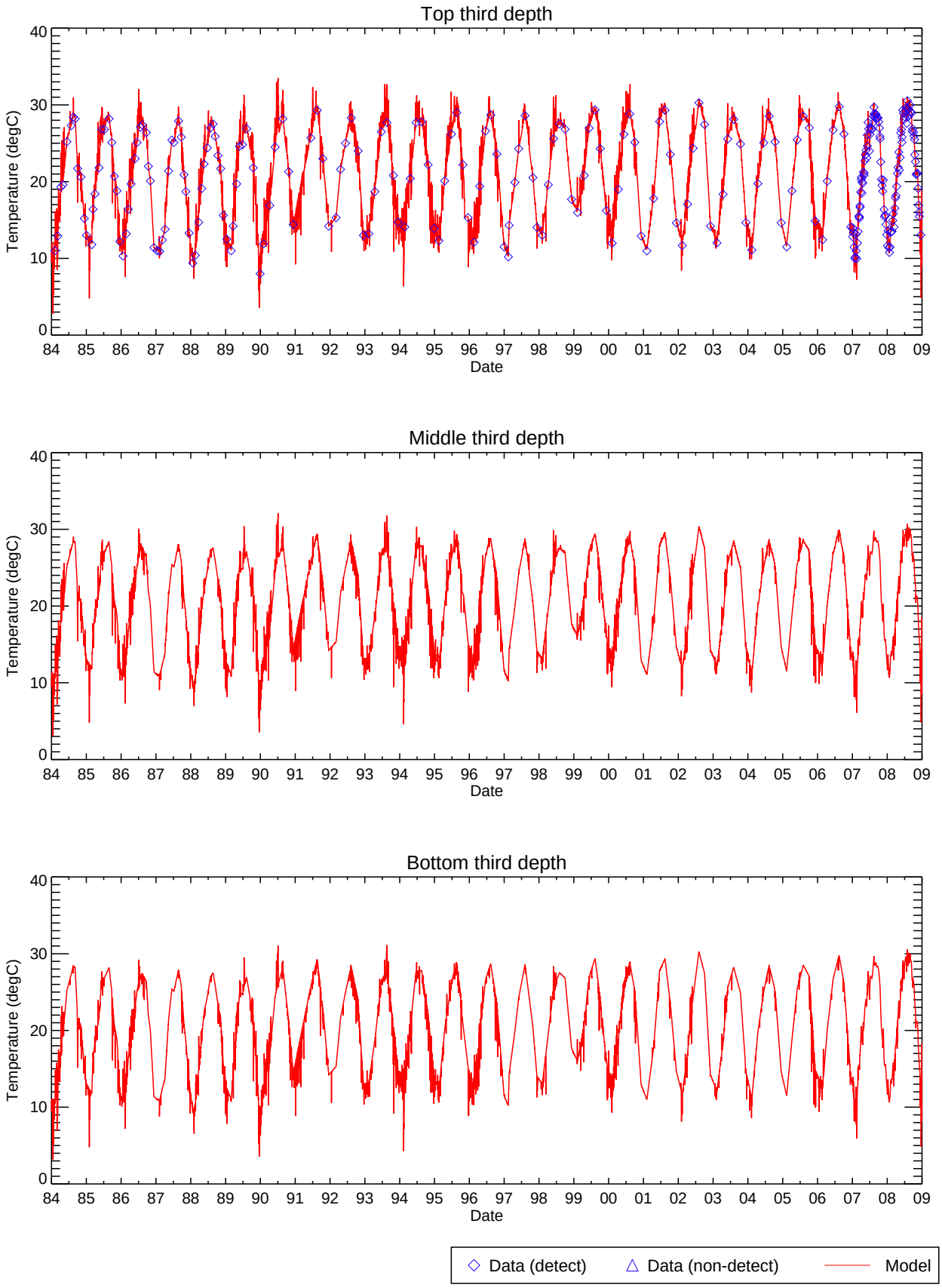


Figure 4-27 Temporal of Model versus Data for Lake Marble Falls at Headwaters (Segment 2) - Temperature

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth

Non-detects plotted at detection limit

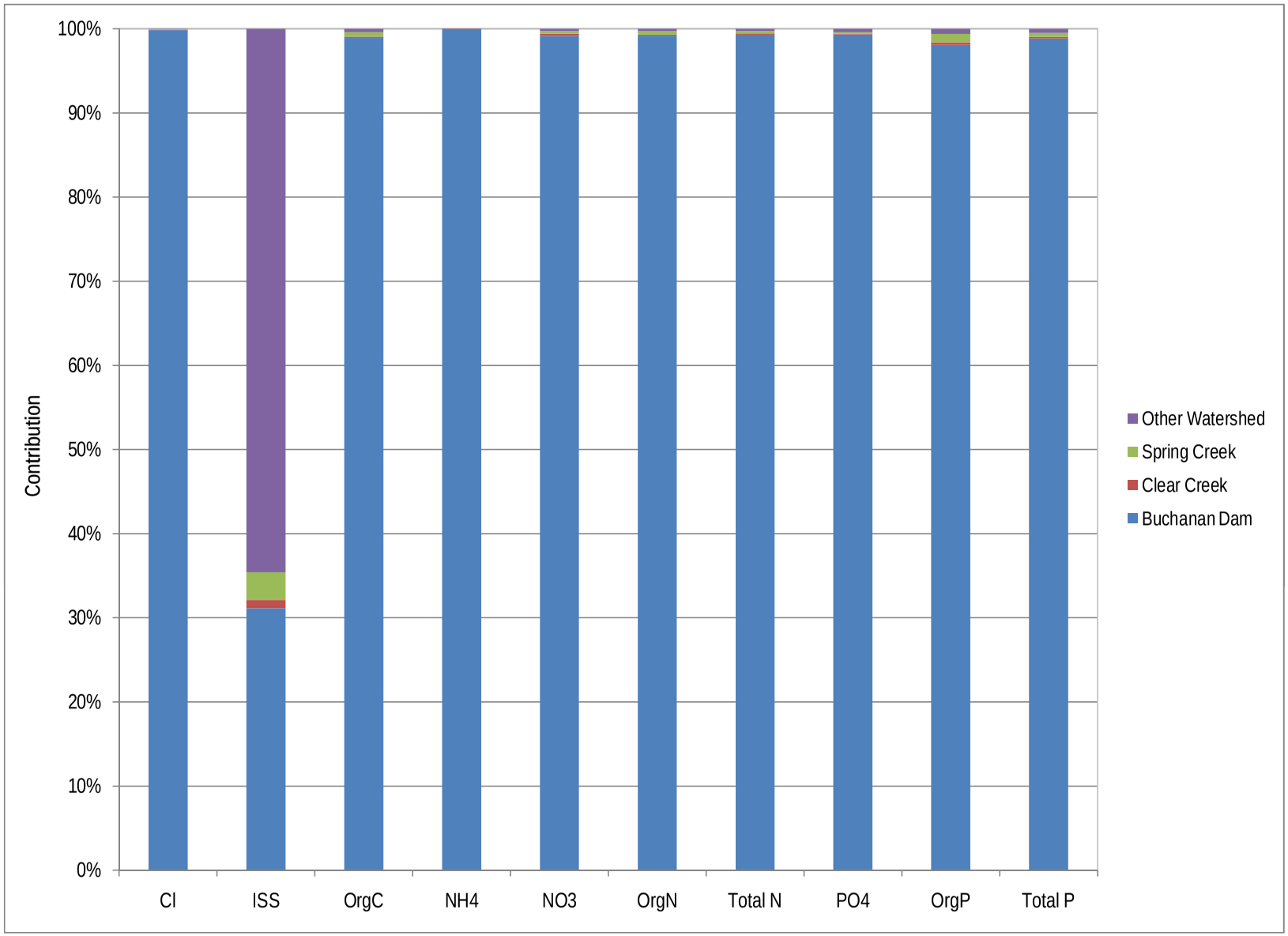


Figure 4-28 Percentage Contribution to Inks Lake by Source Type for Input Constituent Mass

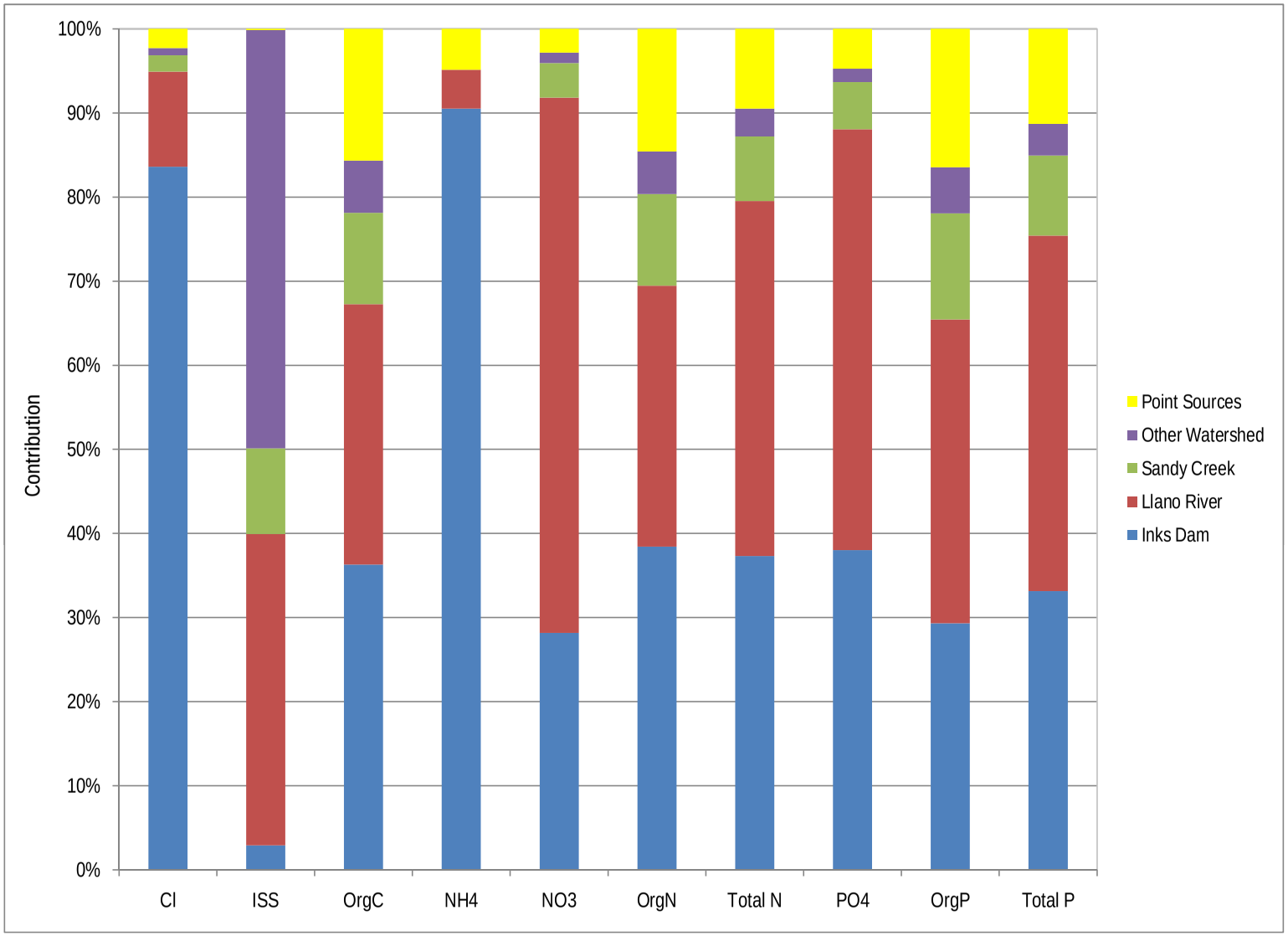


Figure 4-29 Percentage Contribution to Lake LBJ by Source Type for Input Constituent Mass

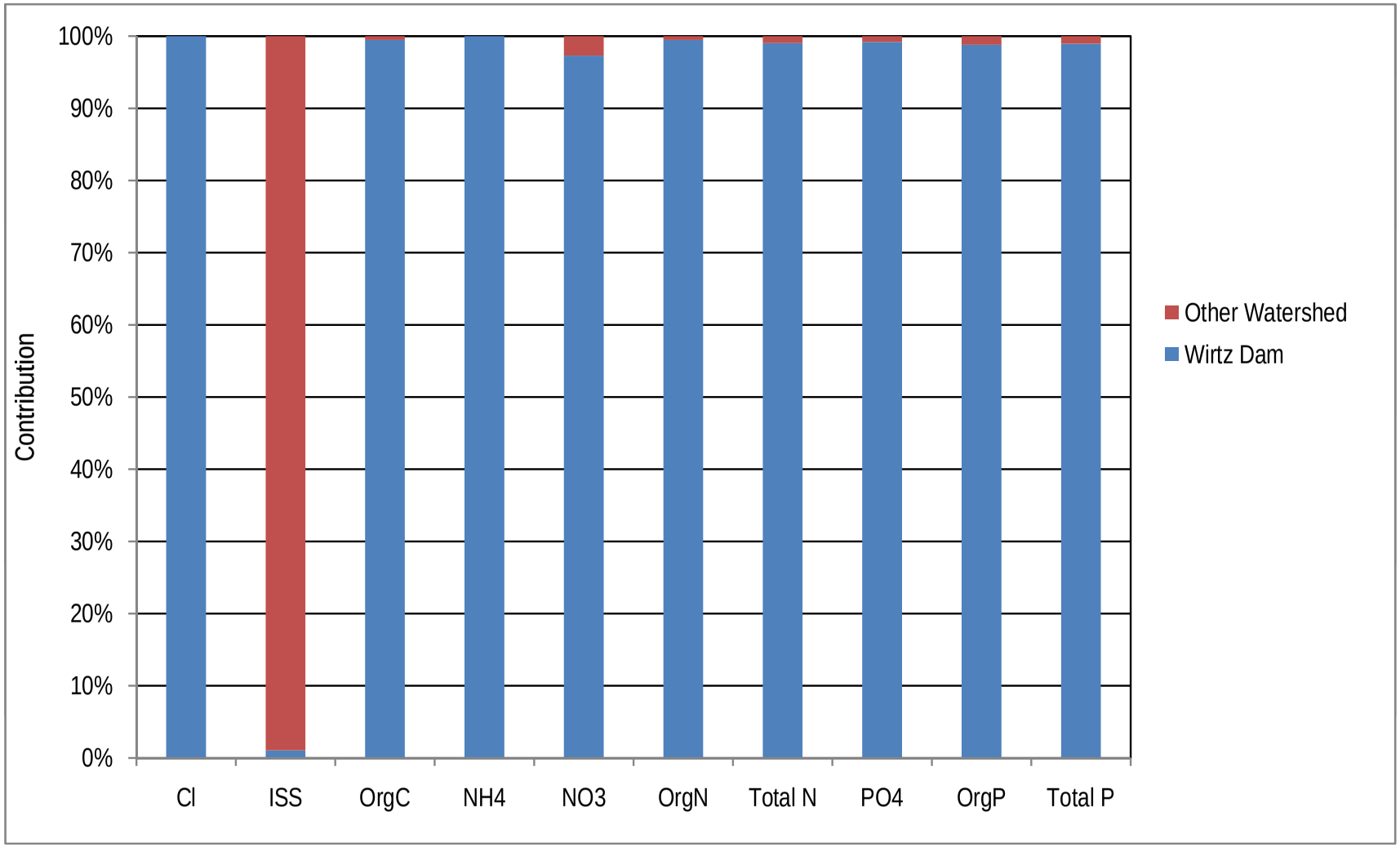


Figure 4-30 Percentage Contribution to Lake Marble Falls by Source Type for Input Constituent Mass

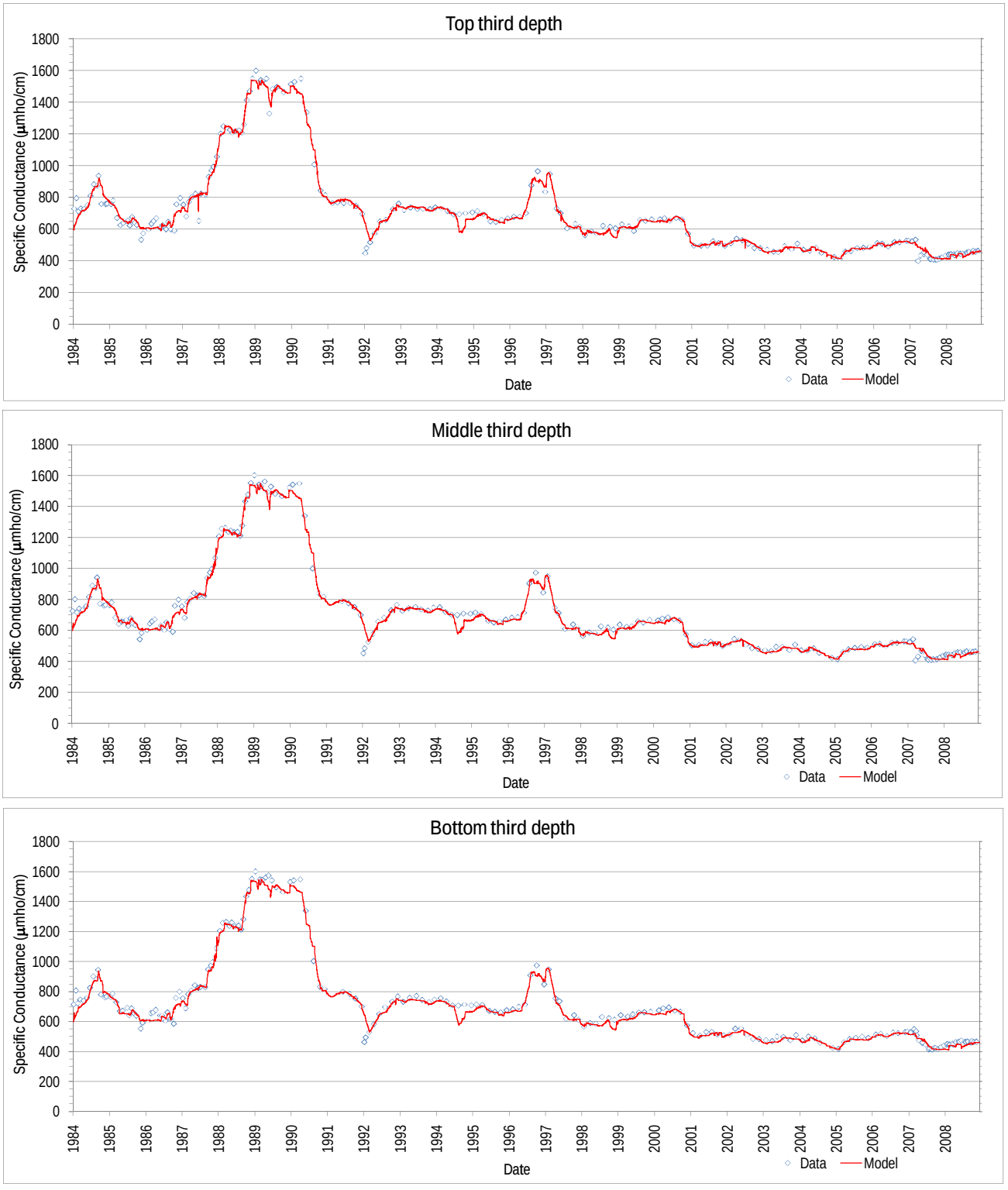


Figure 4-31 Temporal of Model versus Data for Inks Lake at Inks Dam (Segment 15) - Specific Conductance

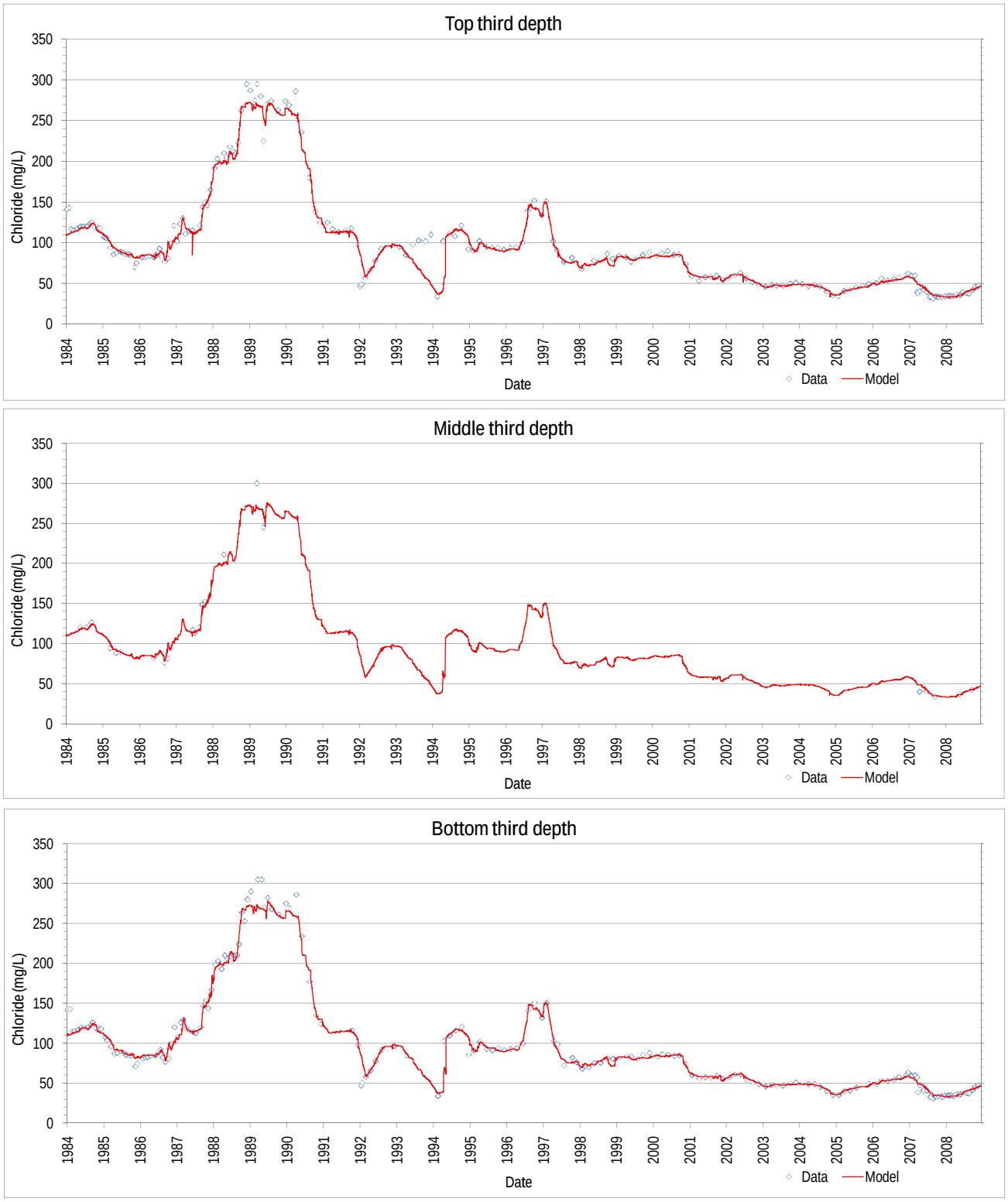


Figure 4-32 Temporal of Model versus Data for Inks Lake at Inks Dam (Segment 15) - Chloride

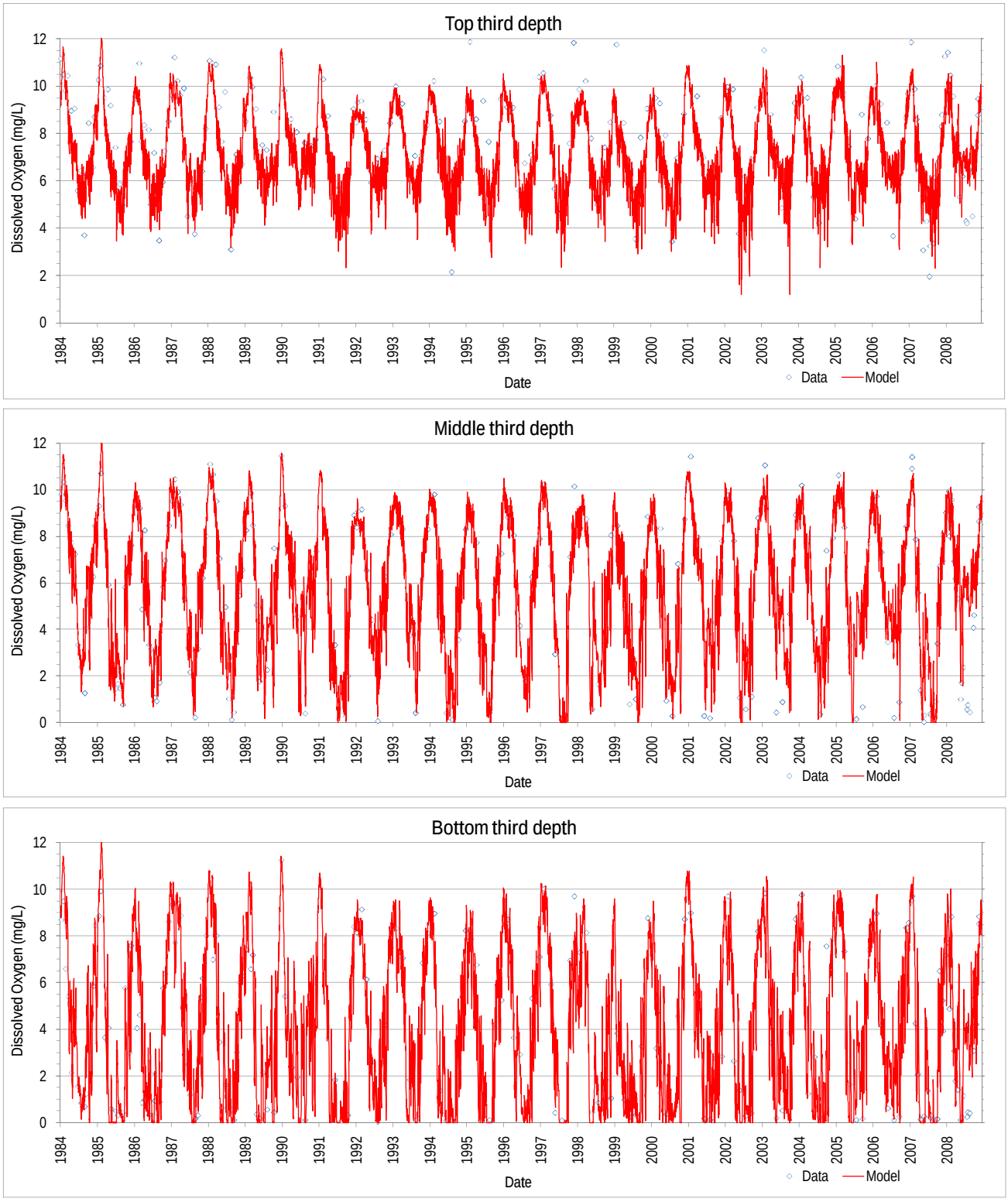


Figure 4-33 Temporal of Model versus Data for Inks Lake at Inks Dam (Segment 15) - Dissolved Oxygen

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

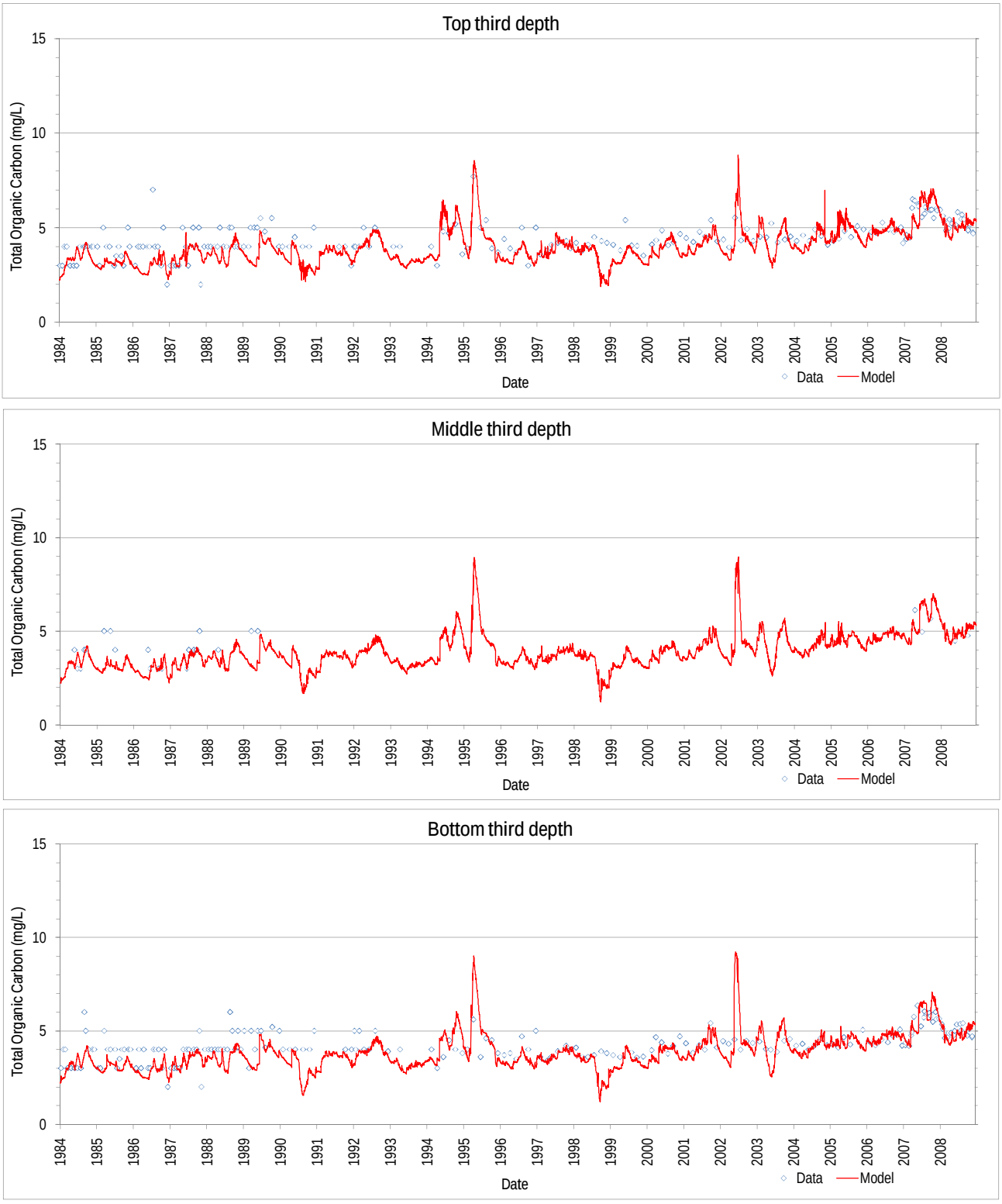


Figure 4-34 Temporal of Model versus Data for Inks Lake at Inks Dam (Segment 15) - Total Organic Carbon

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

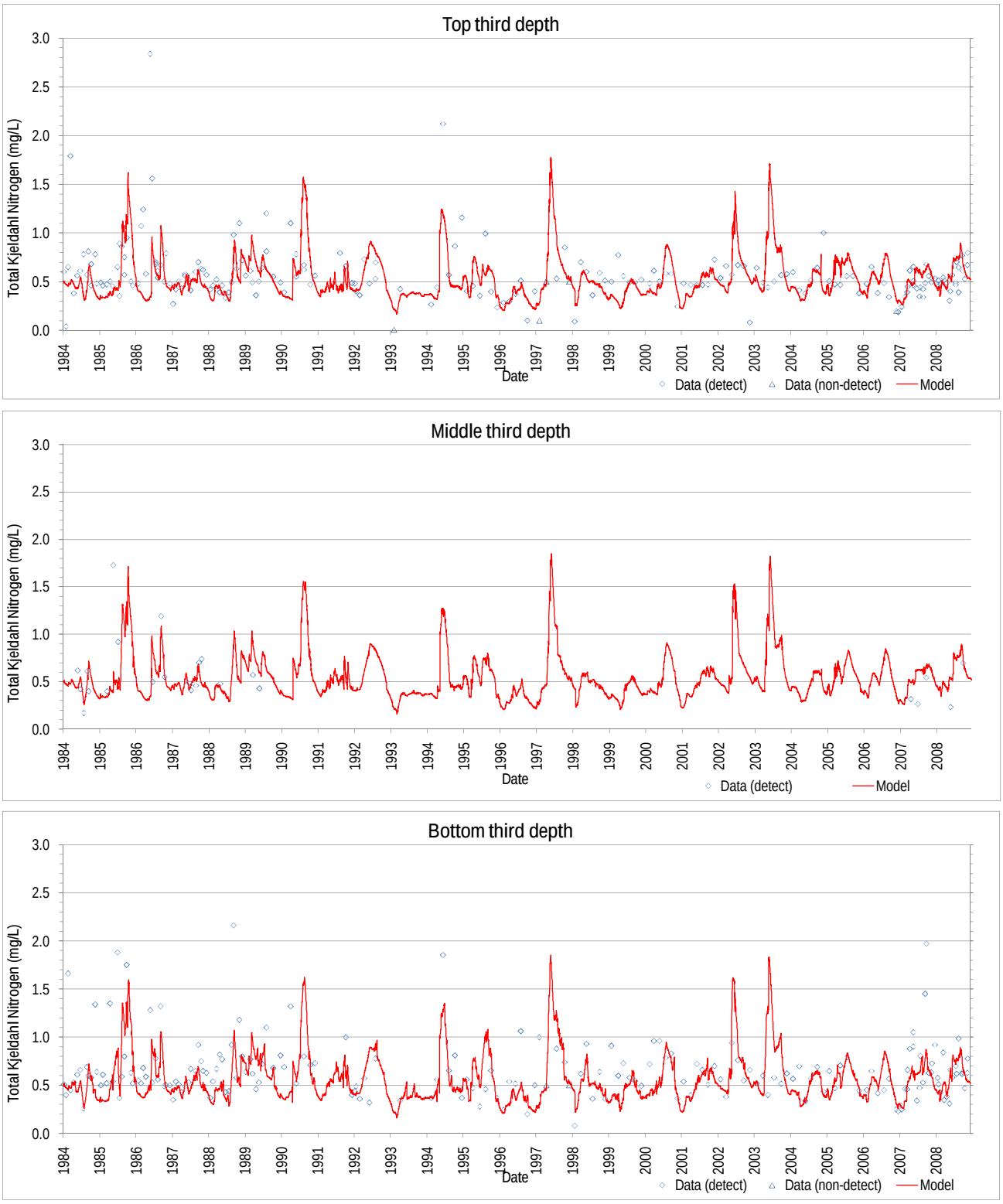


Figure 4-35 Temporal of Model versus Data for Inks Lake at Inks Dam (Segment 15) - Total Kjeldahl Nitrogen

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

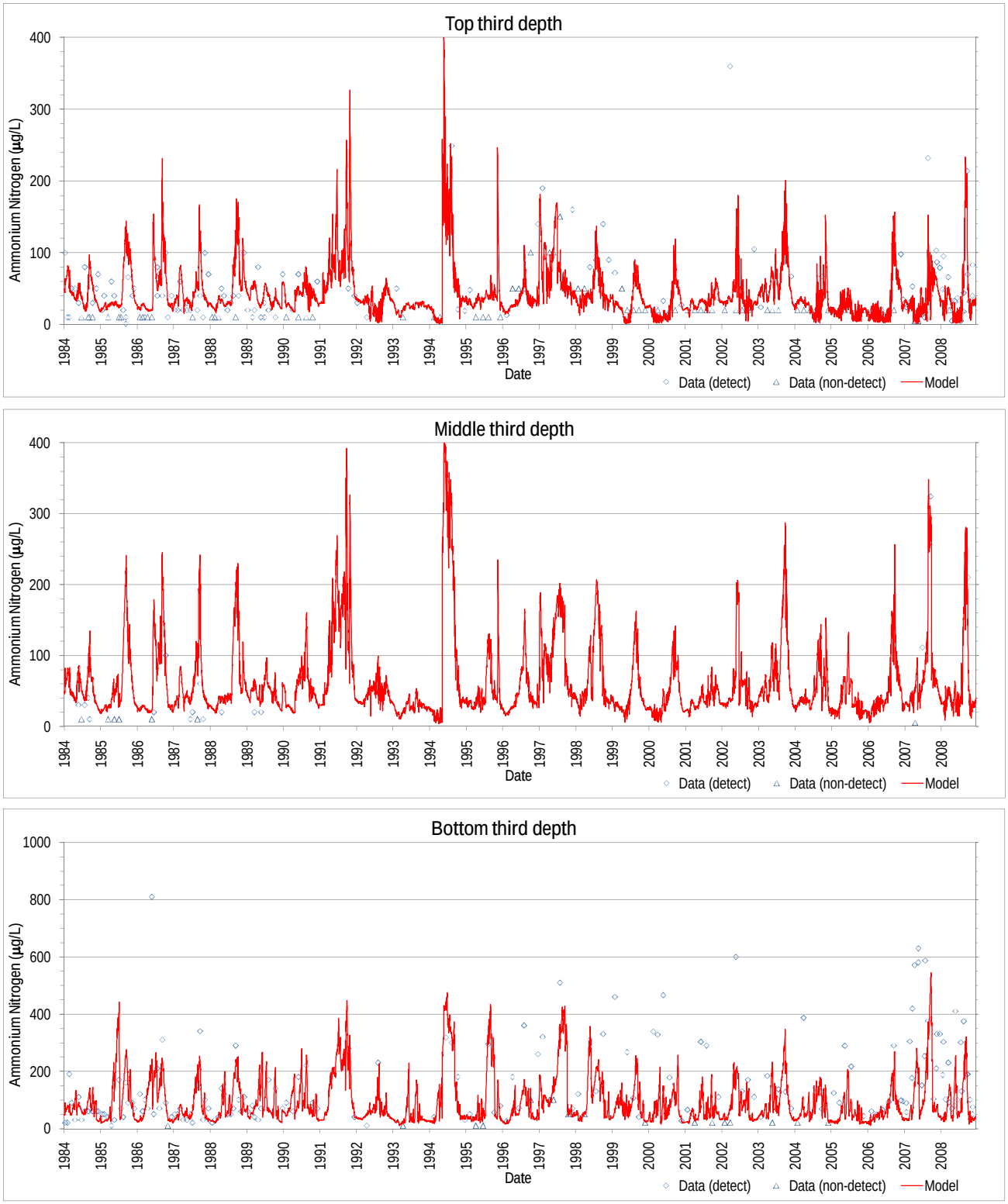


Figure 4-36 Temporal of Model versus Data for Inks Lake at Inks Dam (Segment 15) - Ammonium Nitrogen

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

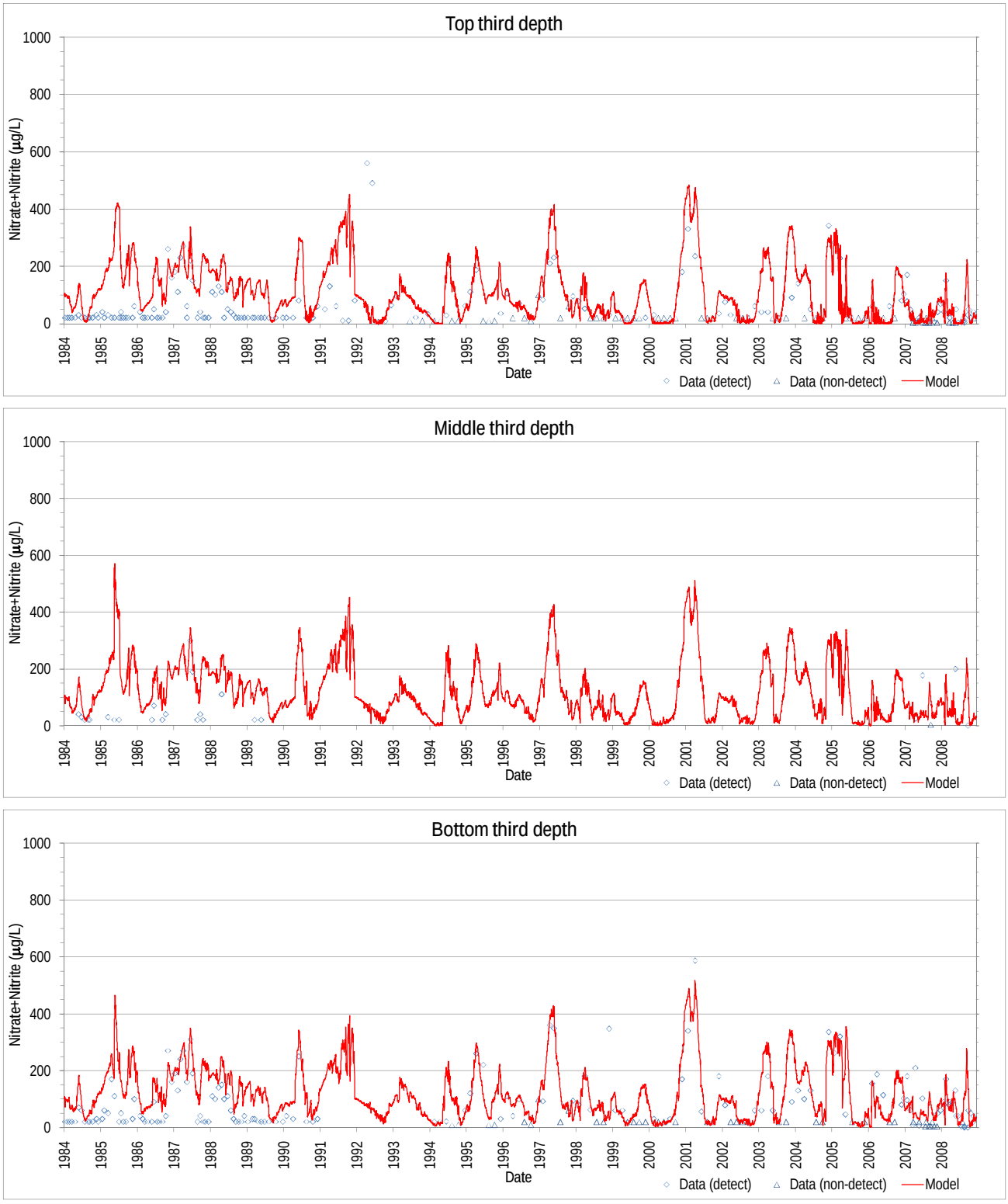


Figure 4-37 Temporal of Model versus Data for Inks Lake at Inks Dam (Segment 15) - Nitrate+Nitrite

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

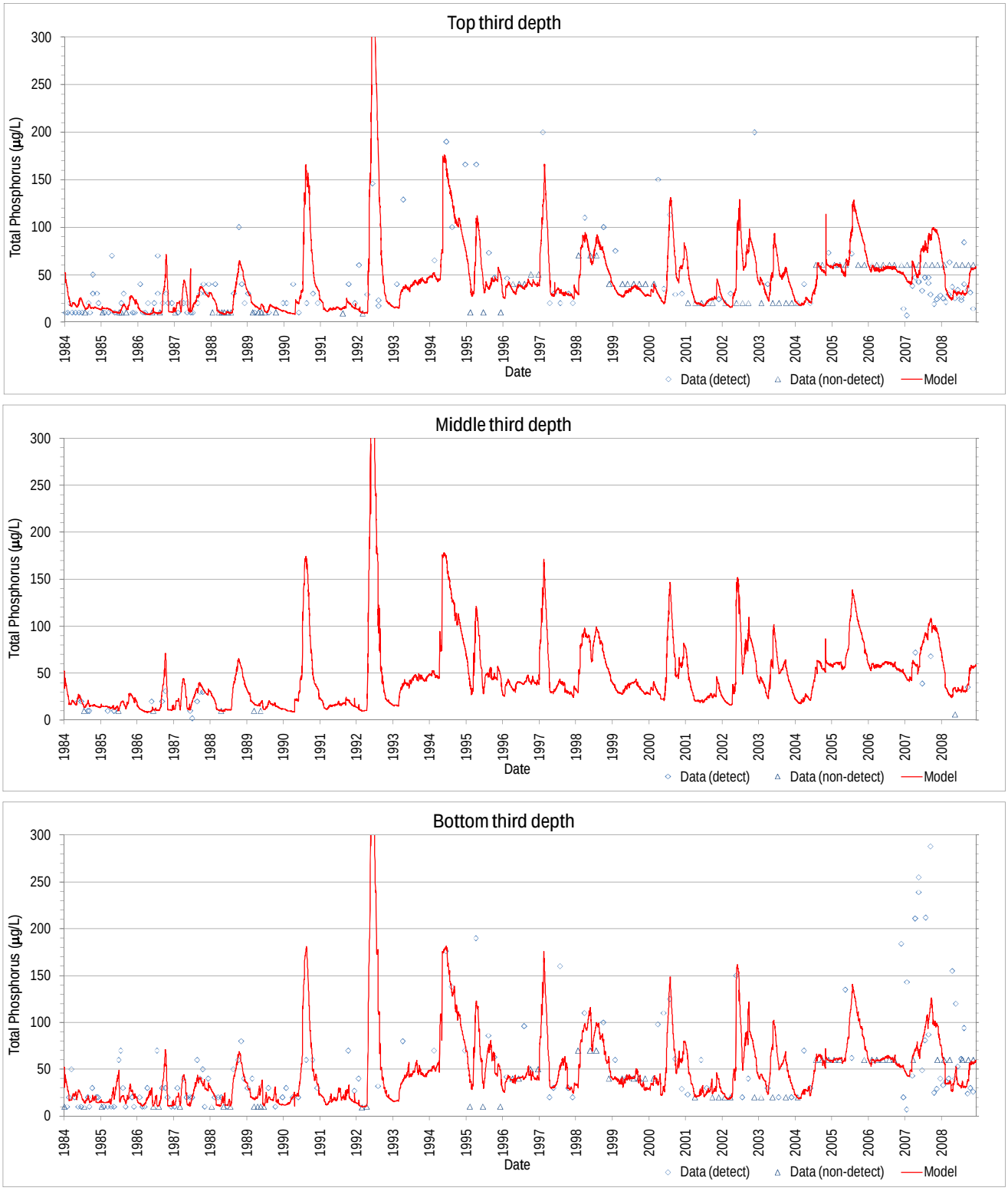
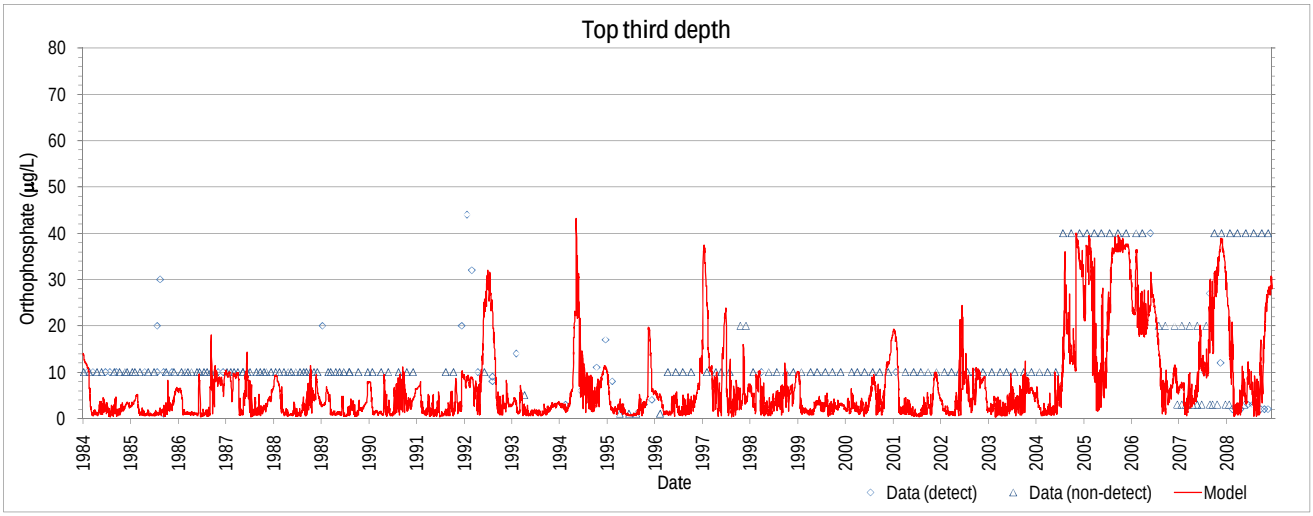


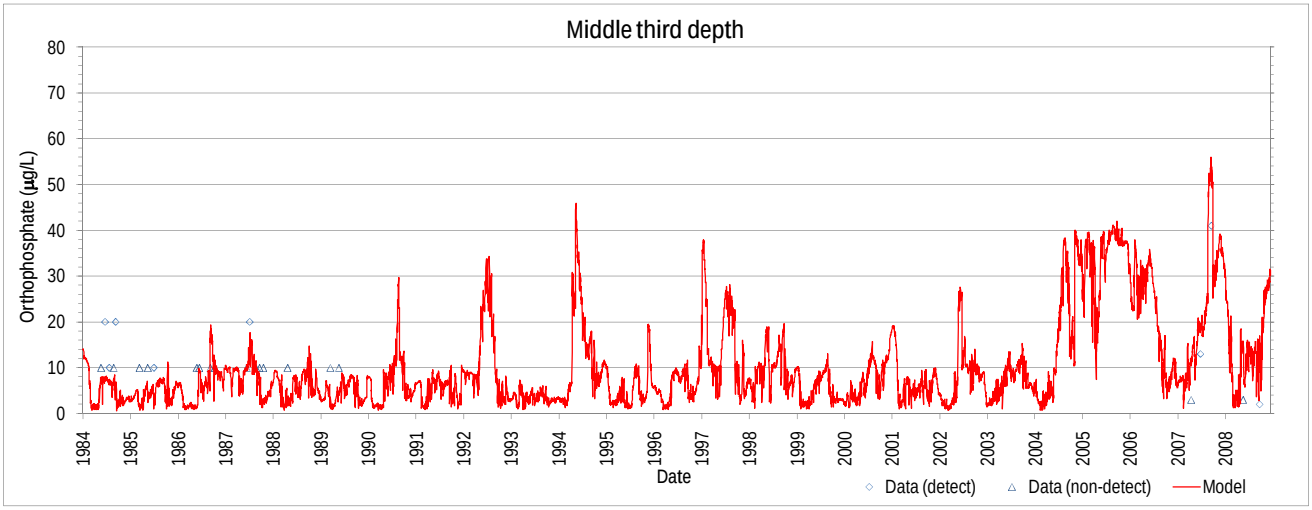
Figure 4-38 Temporal of Model versus Data for Inks Lake at Inks Dam (Segment 15) - Total Phosphorus

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit





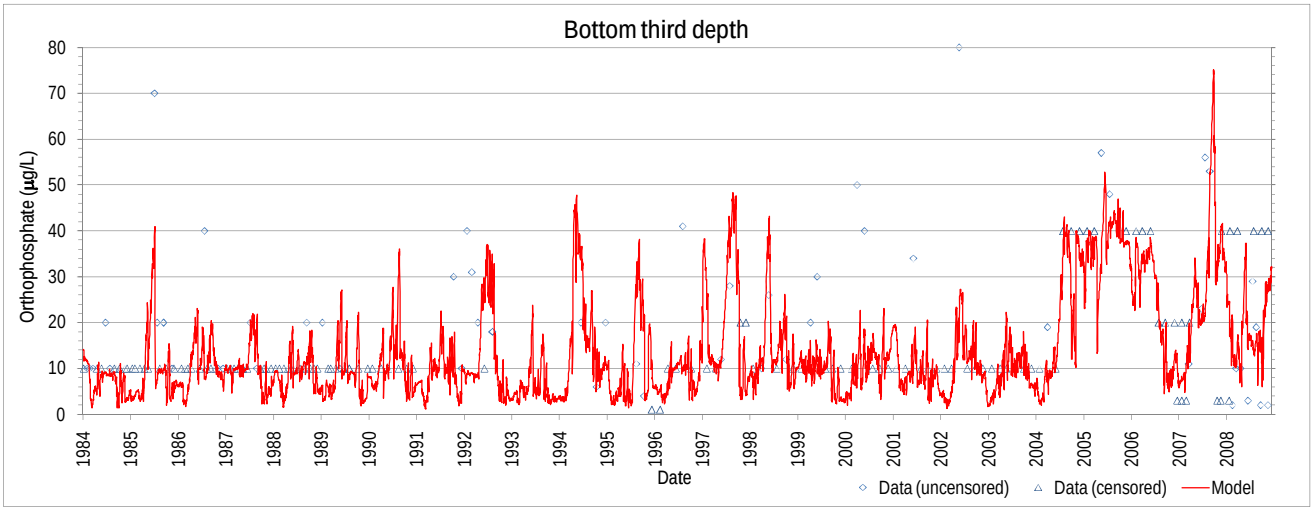


Figure 4-39 Temporal of Model versus Data for Inks Lake at Inks Dam (Segment 15) - Orthophosphate

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

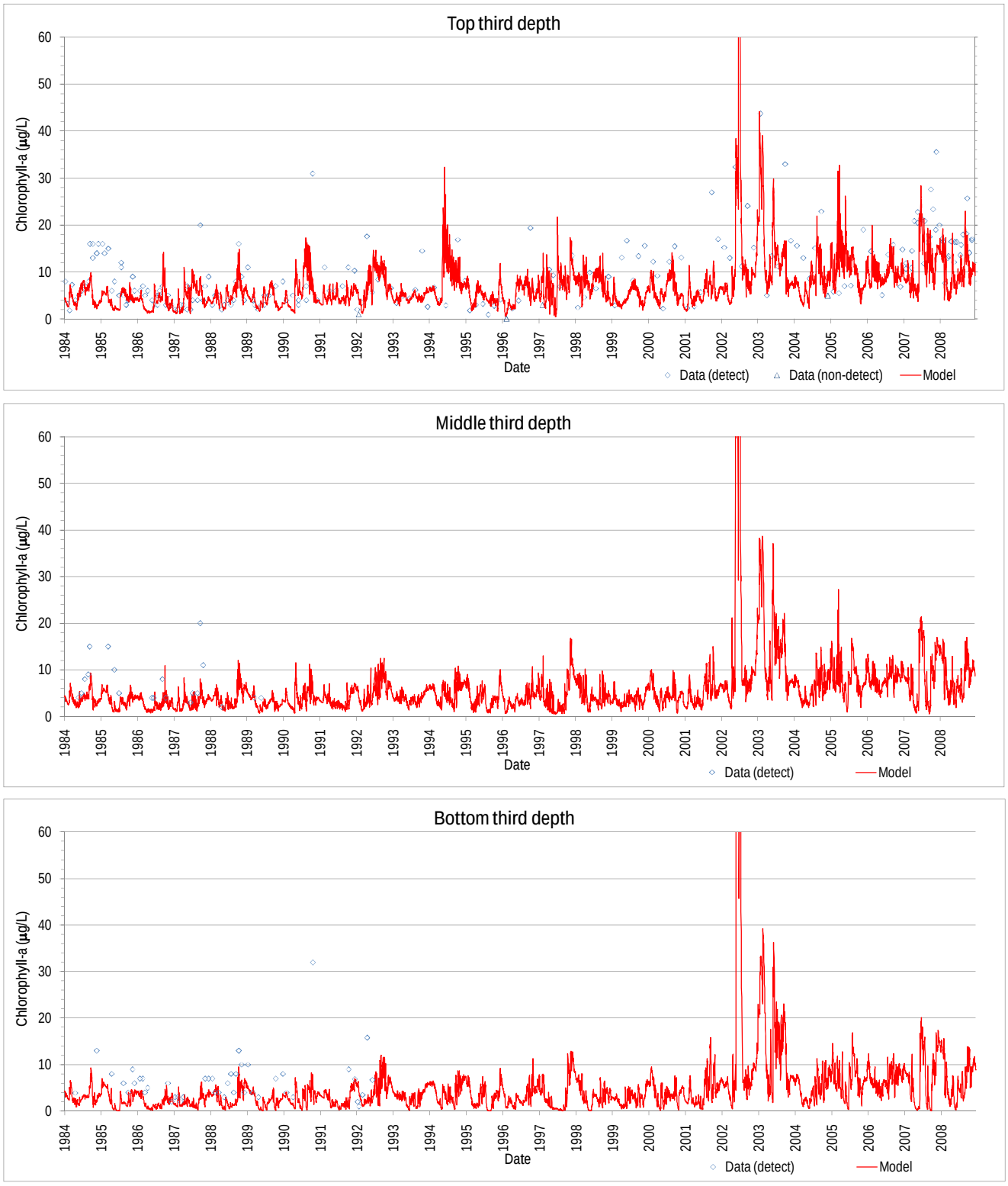


Figure 4-40 Temporal of Model versus Data for Inks Lake at Inks Dam (Segment 15) - Chlorophyll a

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

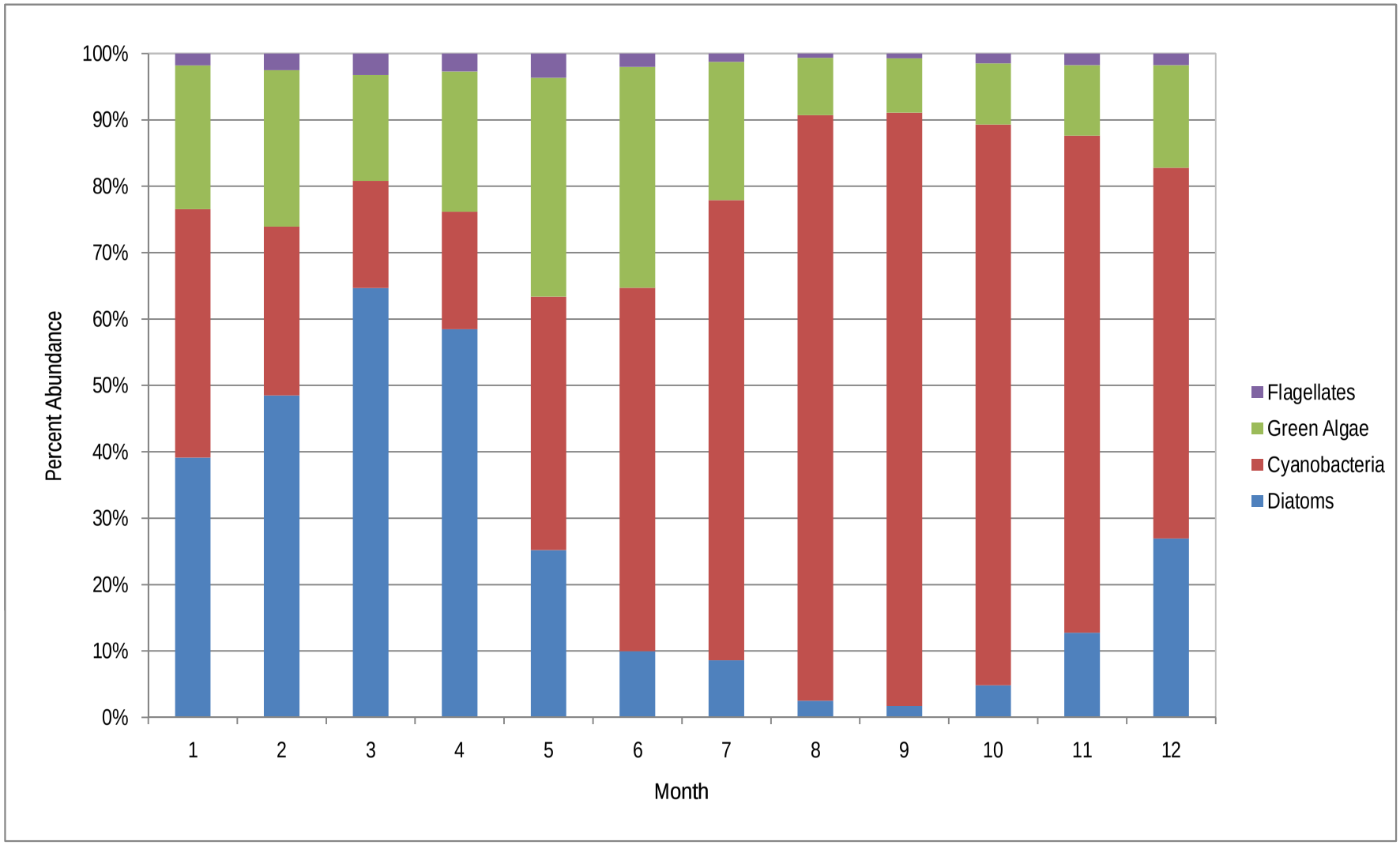


Figure 4-41 Predicted Seasonal Abundances of Major Algal Groups in Inks Lake

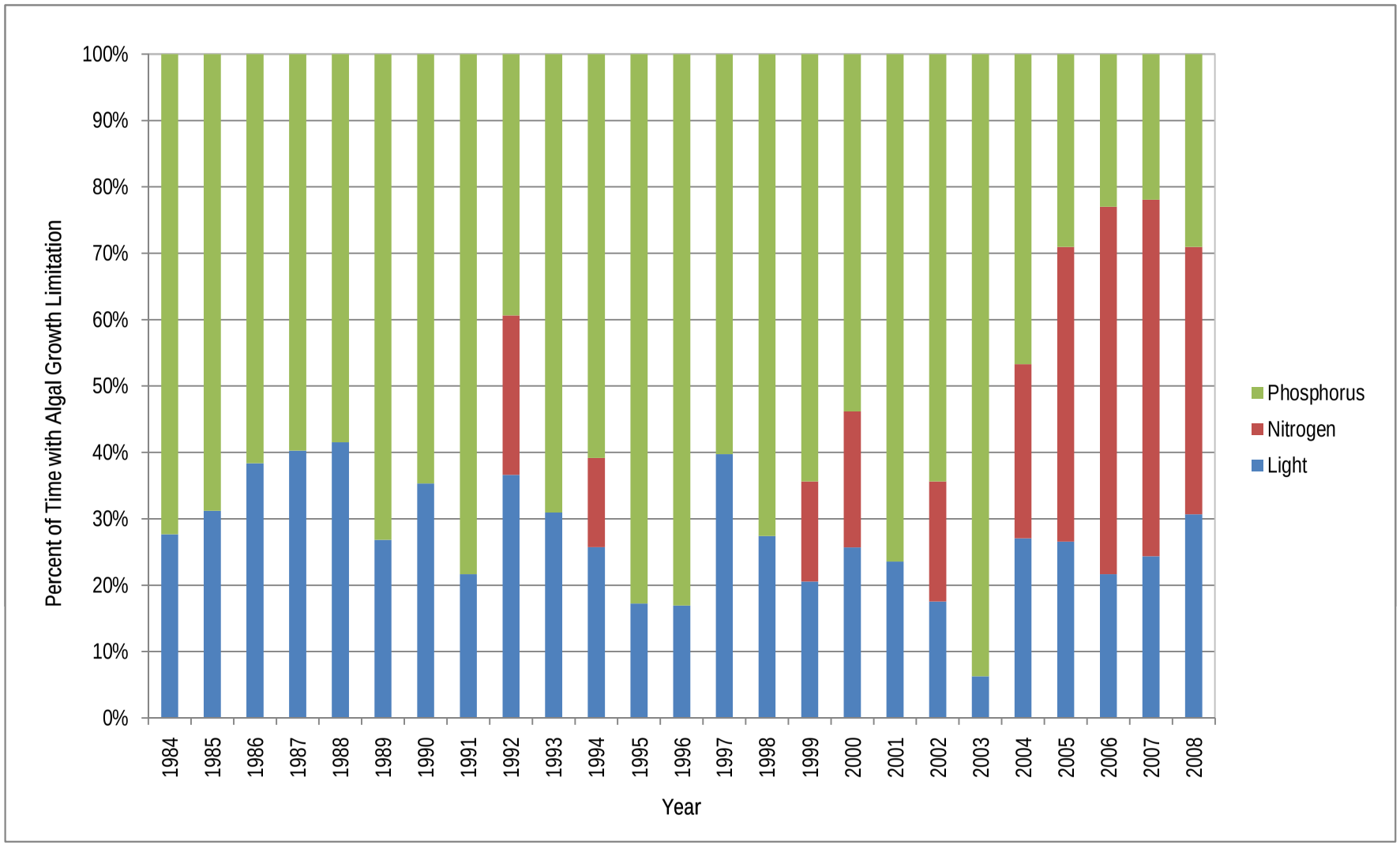


Figure 4-42 Algal Growth Limiting factors by Year in Inks Lake

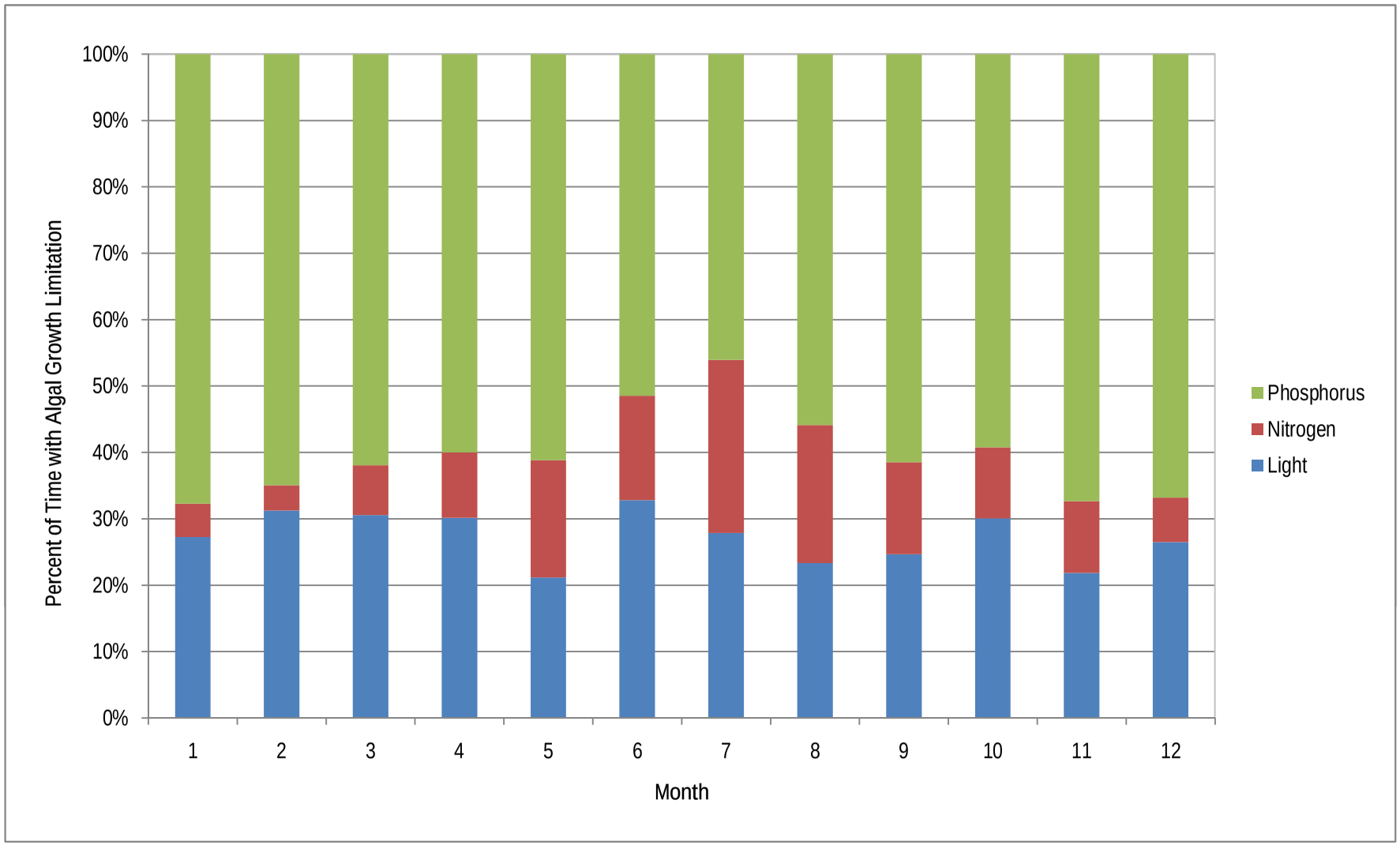


Figure 4-43 Algal Growth Limiting factors by Month in Inks Lake

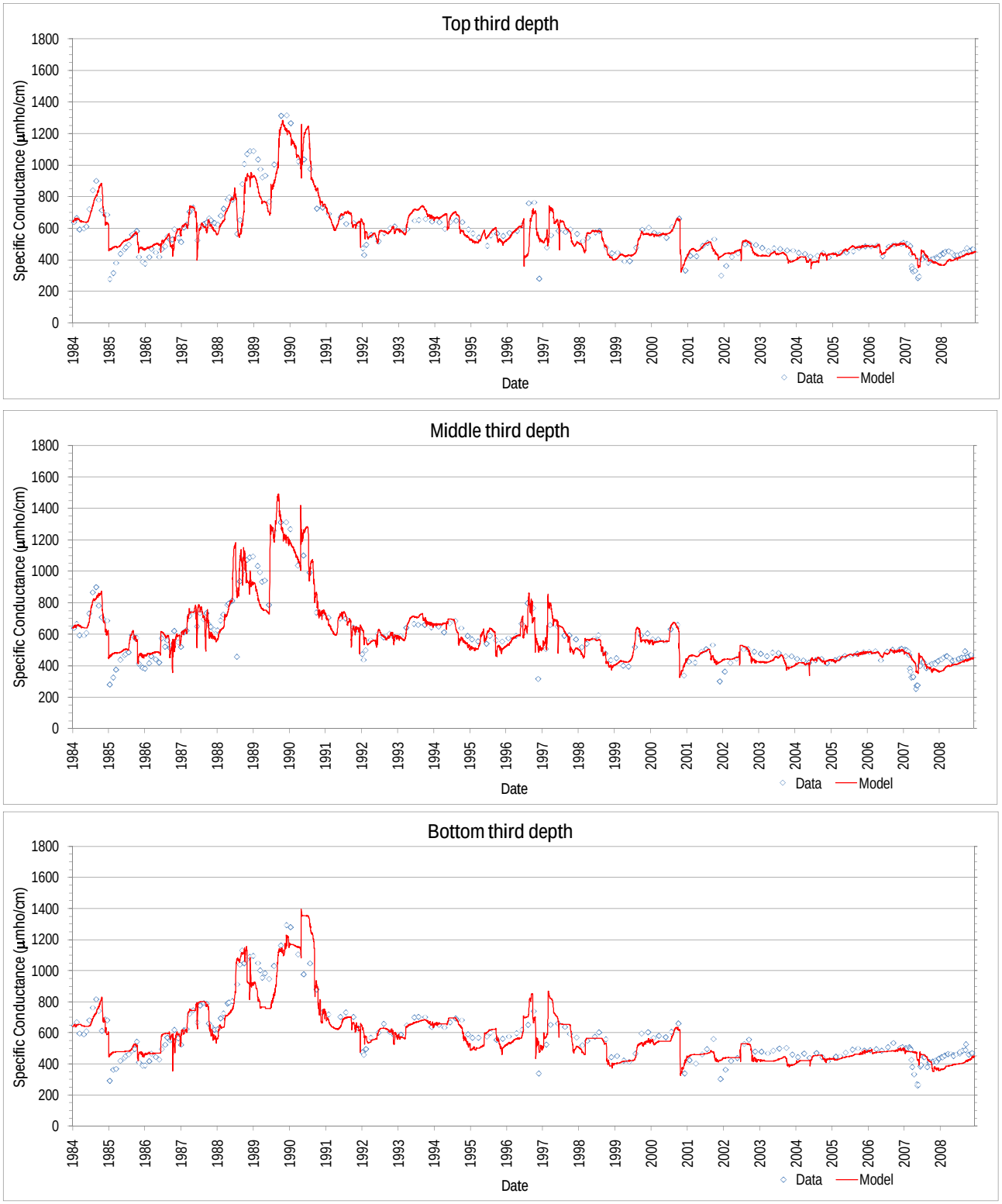


Figure 4-44 Temporal of Model versus Data for LBJ near Alvin Wirtz Dam (Segment 54) - Specific Conductance

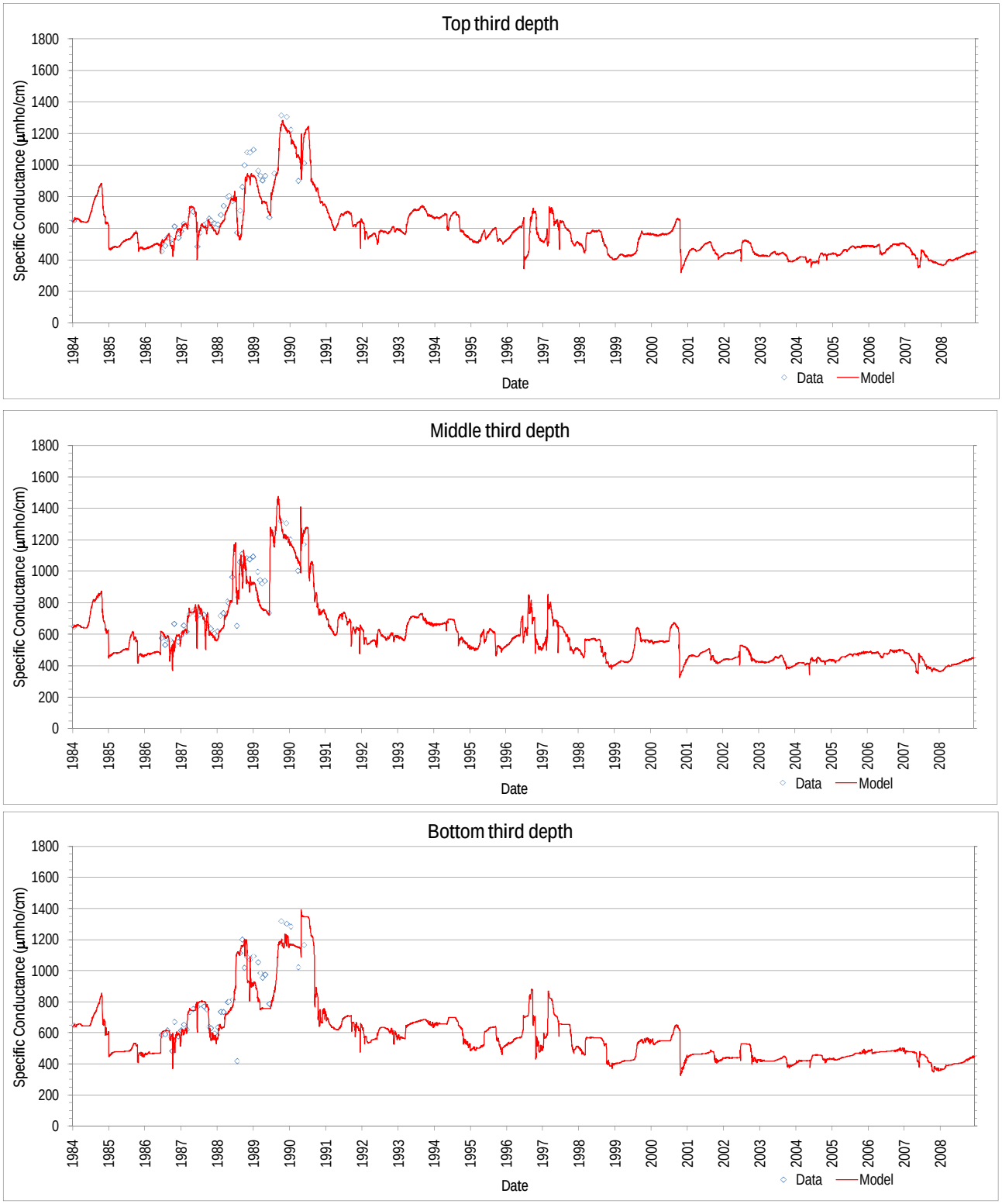


Figure 4-45 Temporal of Model versus Data for LBJ at the Narrows (Segment 53) - Specific Conductance

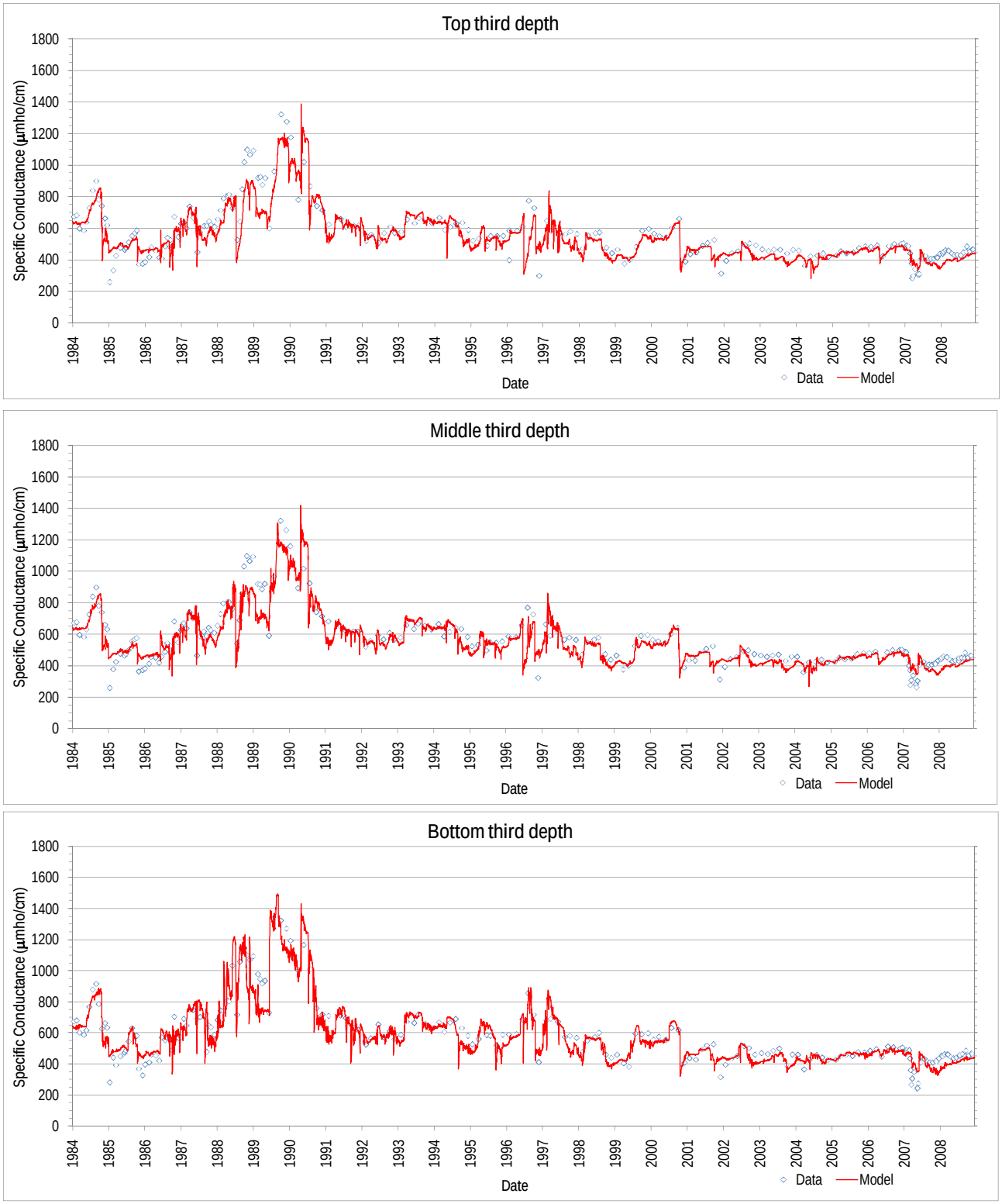


Figure 4-46 Temporal of Model versus Data for LBJ at Confluence with Sandy Creek Arm (Segment 41) - Specific Conductance

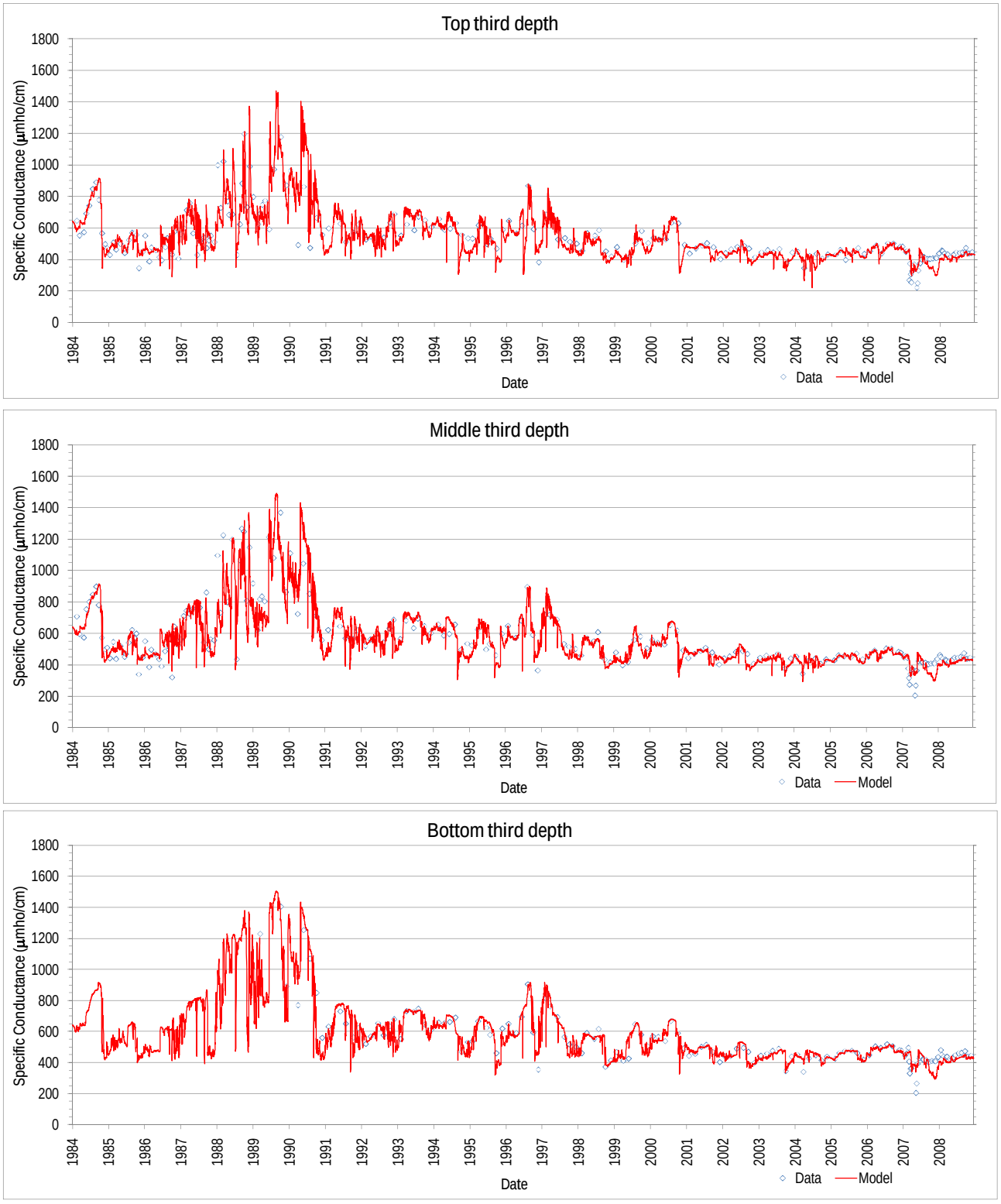


Figure 4-47 Temporal of Model versus Data for LBJ at Confluence with Llano River Arm (Segment 30) - Specific Conductance

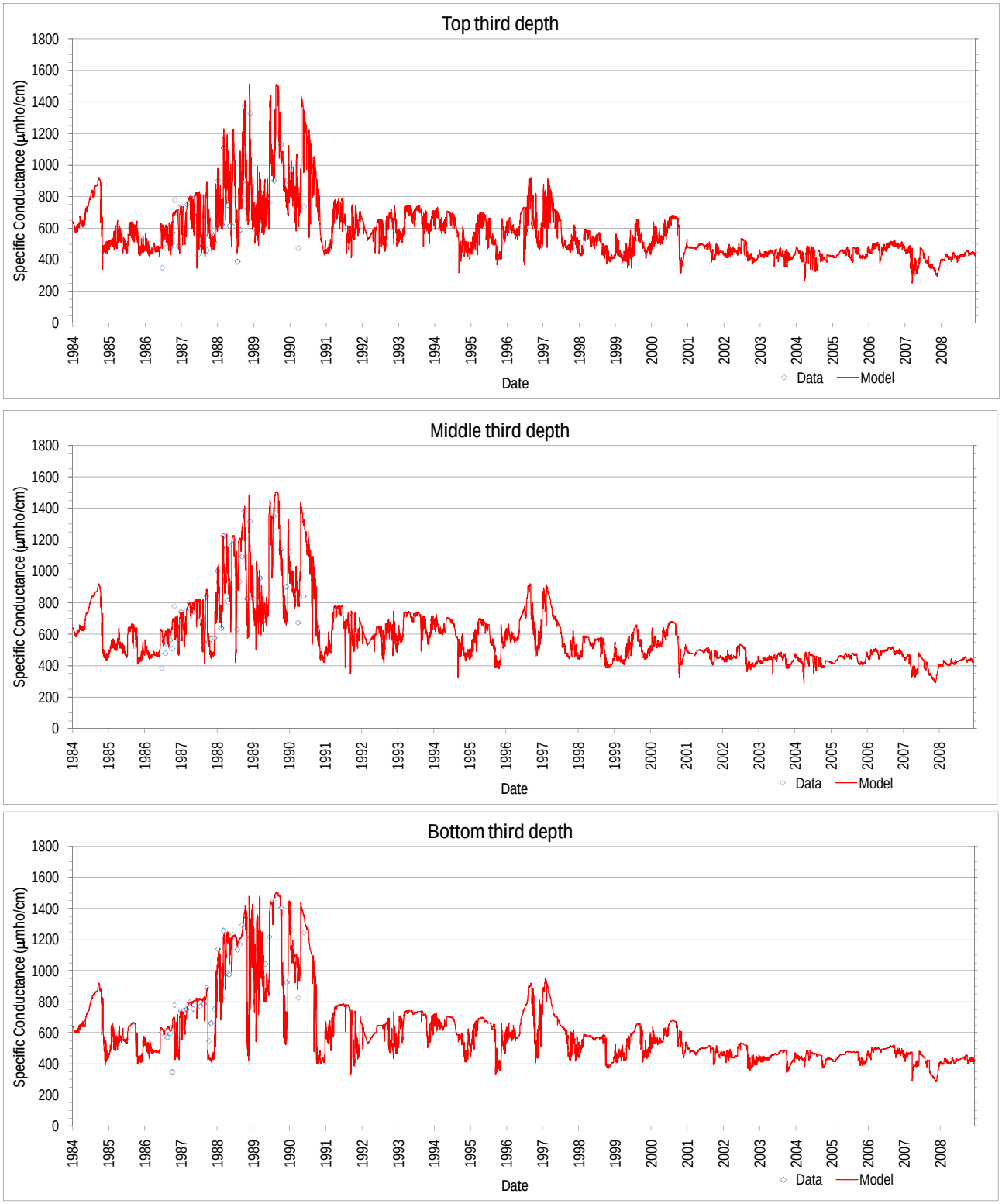


Figure 4-48 Temporal of Model versus Data for LBJ at FM 1431 (Segment 26) - Specific Conductance

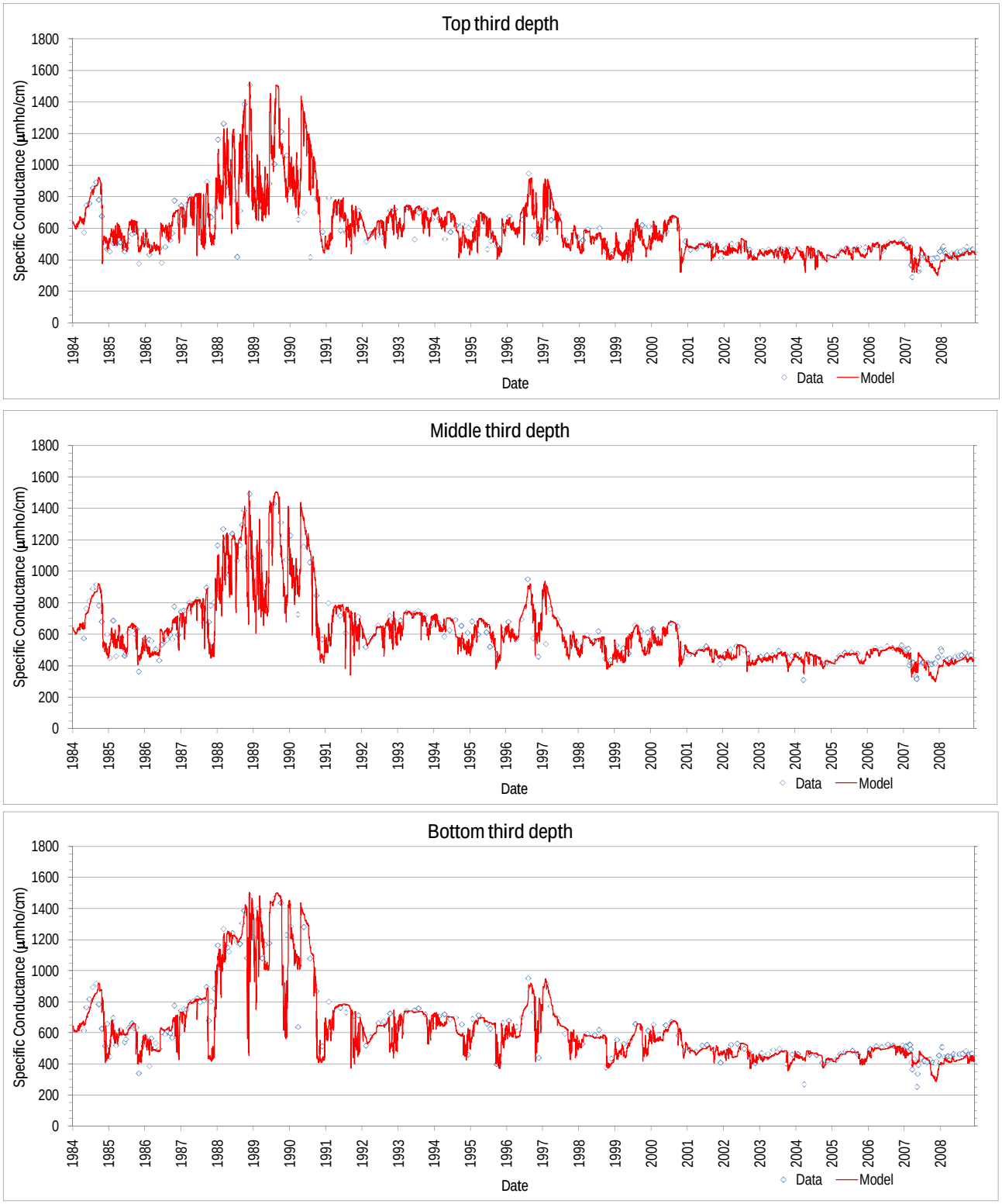


Figure 4-49 Temporal of Model versus Data for LBJ at Kingsland Cove (Segment 24) - Specific Conductance

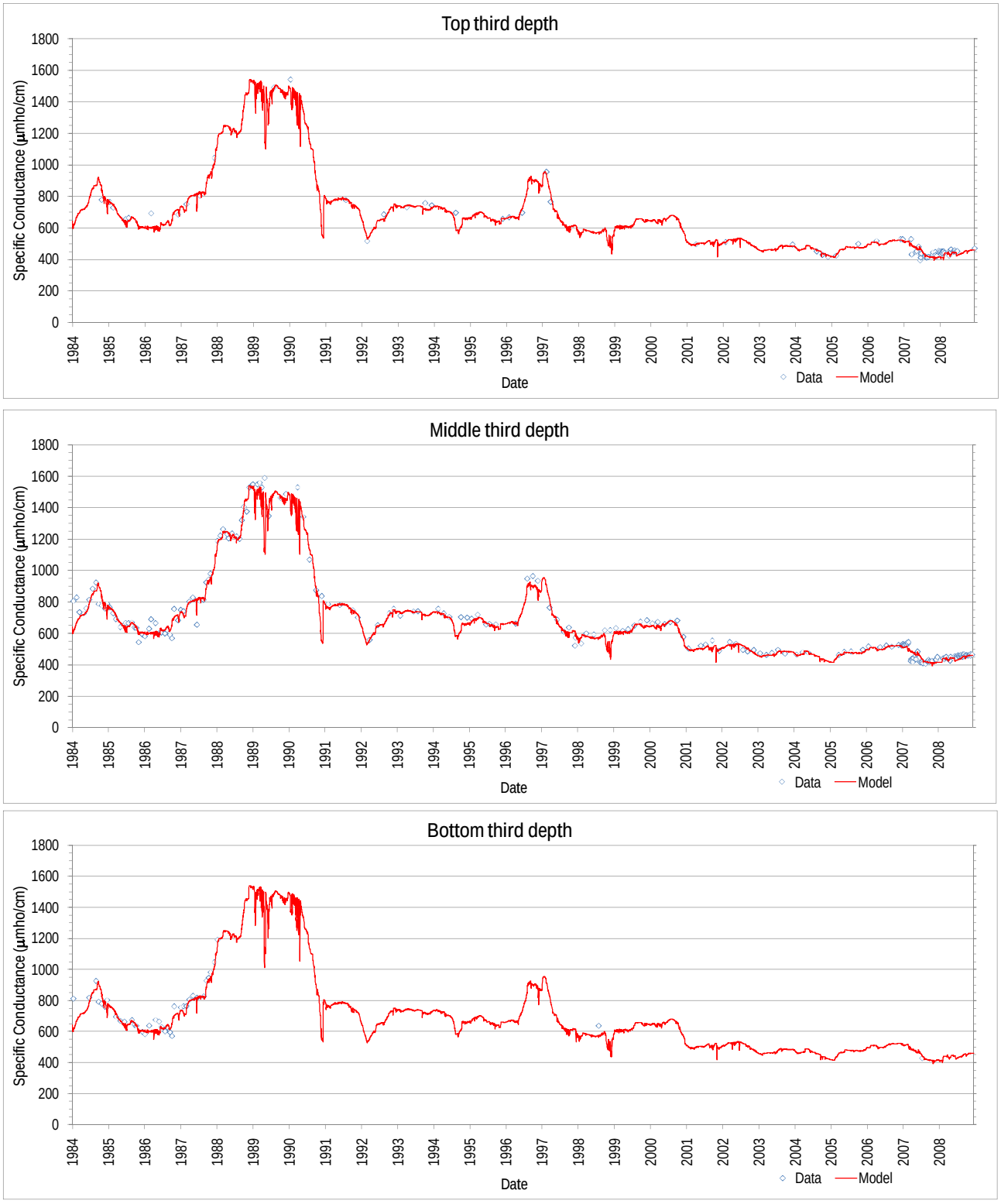


Figure 4-50 Temporal of Model versus Data for LBJ at Headwaters (Segment 2) - Specific Conductance

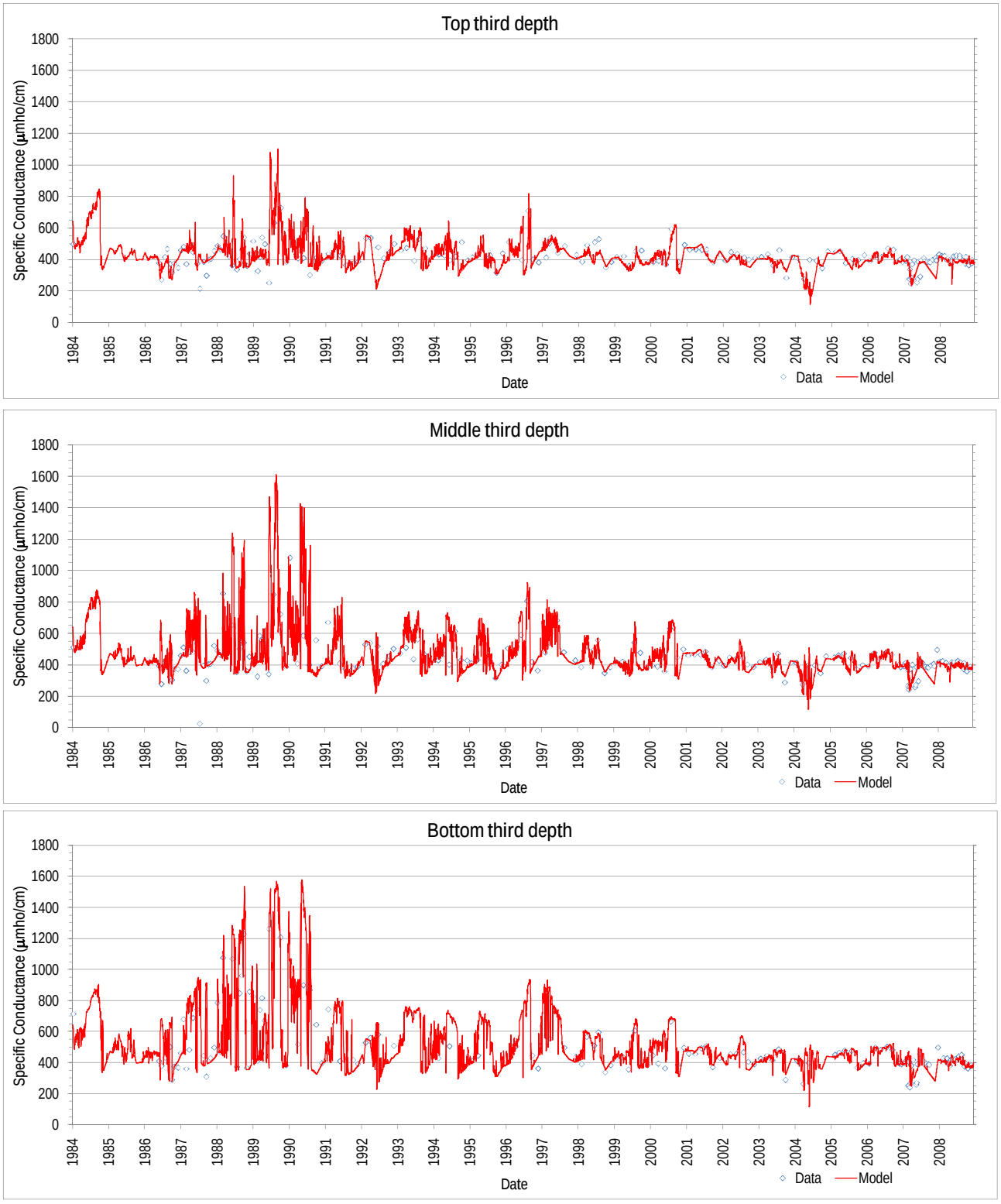


Figure 4-51 Temporal of Model versus Data for LBJ at FM 2900 (Segment 62) - Specific Conductance

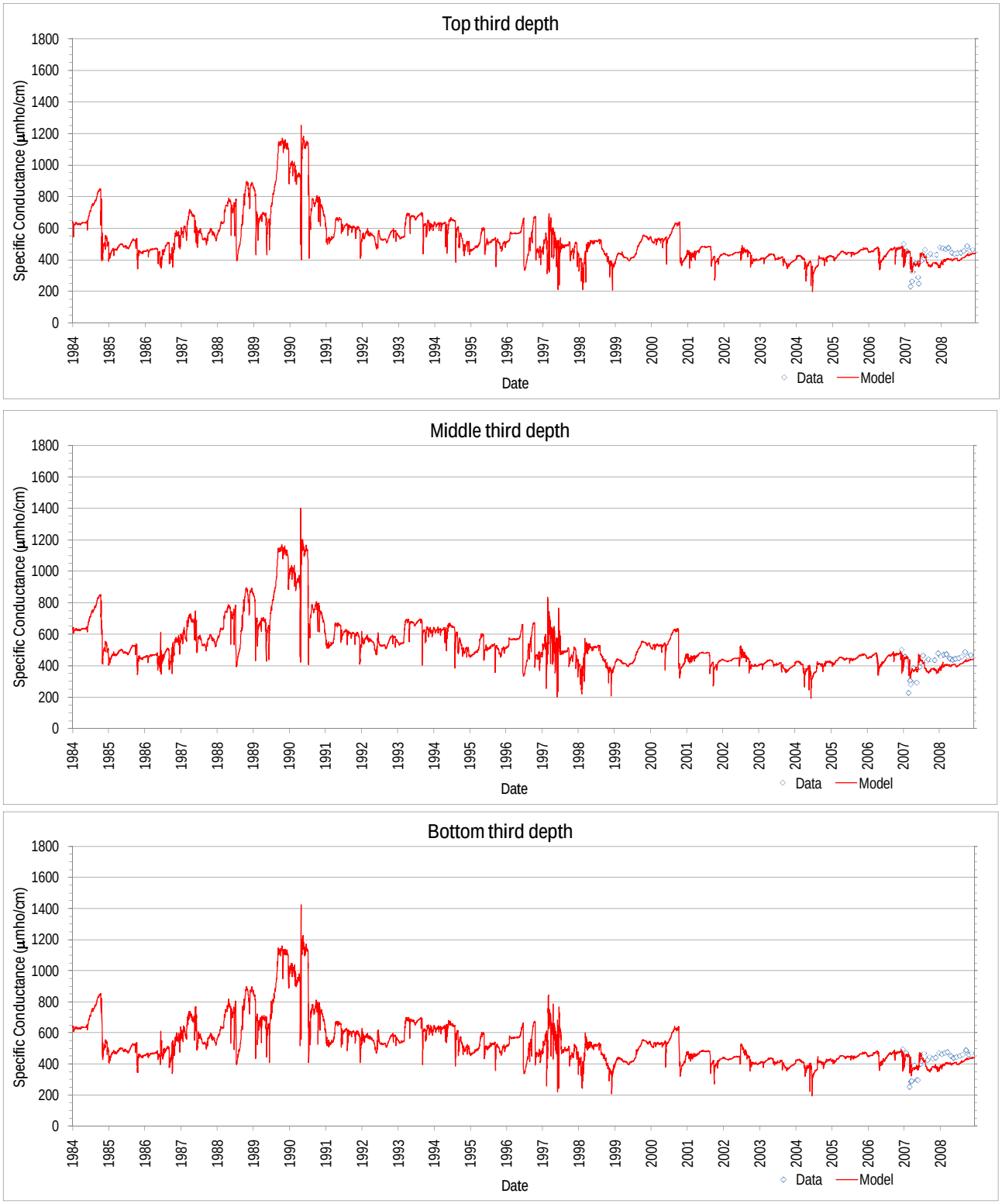


Figure 4-52 Temporal of Model versus Data for LBJ near Lake Shore Drive (Segment 78) - Specific Conductance

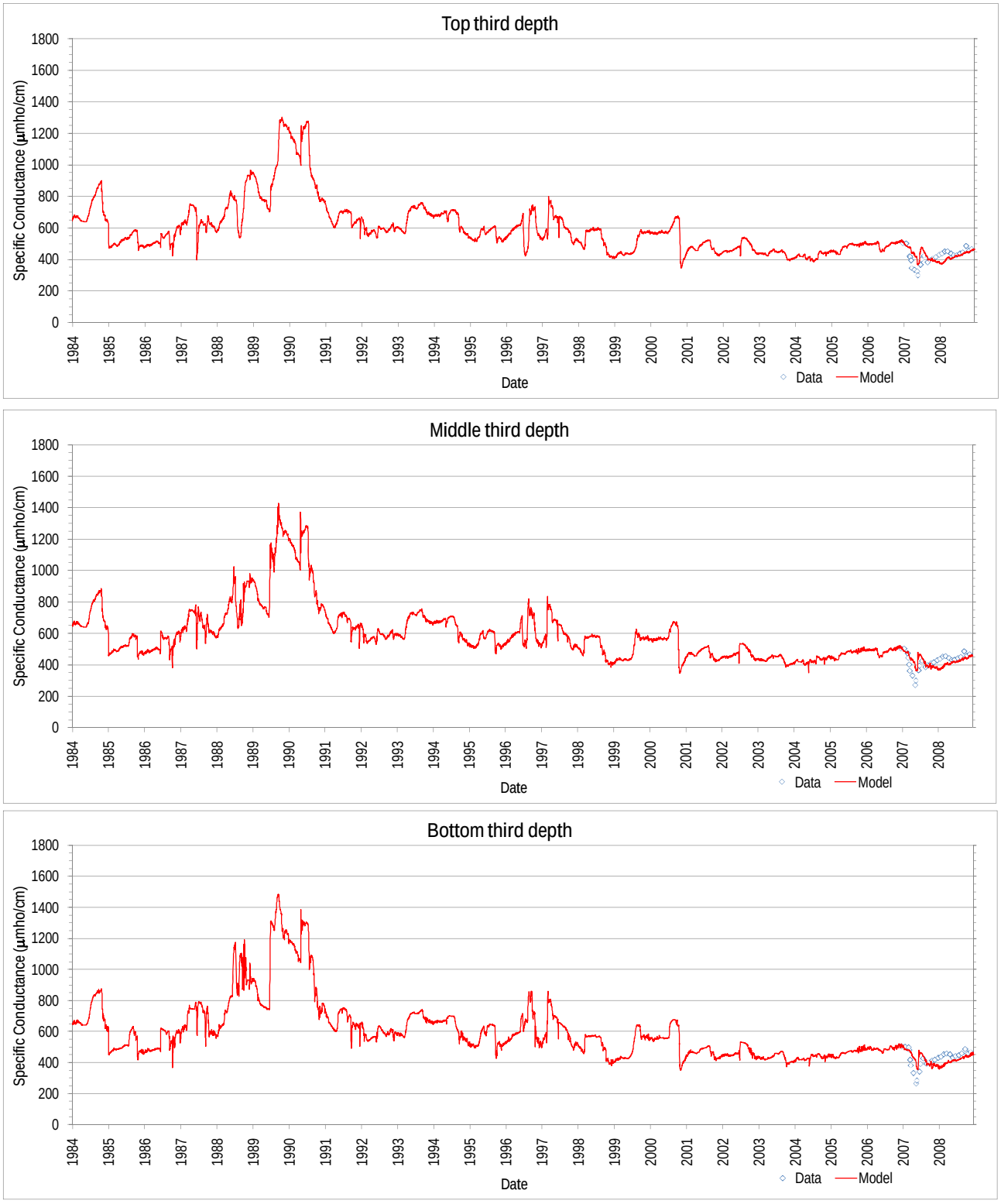


Figure 4-53 Temporal of Model versus Data for LBJ at Horseshoe Bay Cove (Segment 100) - Specific Conductance

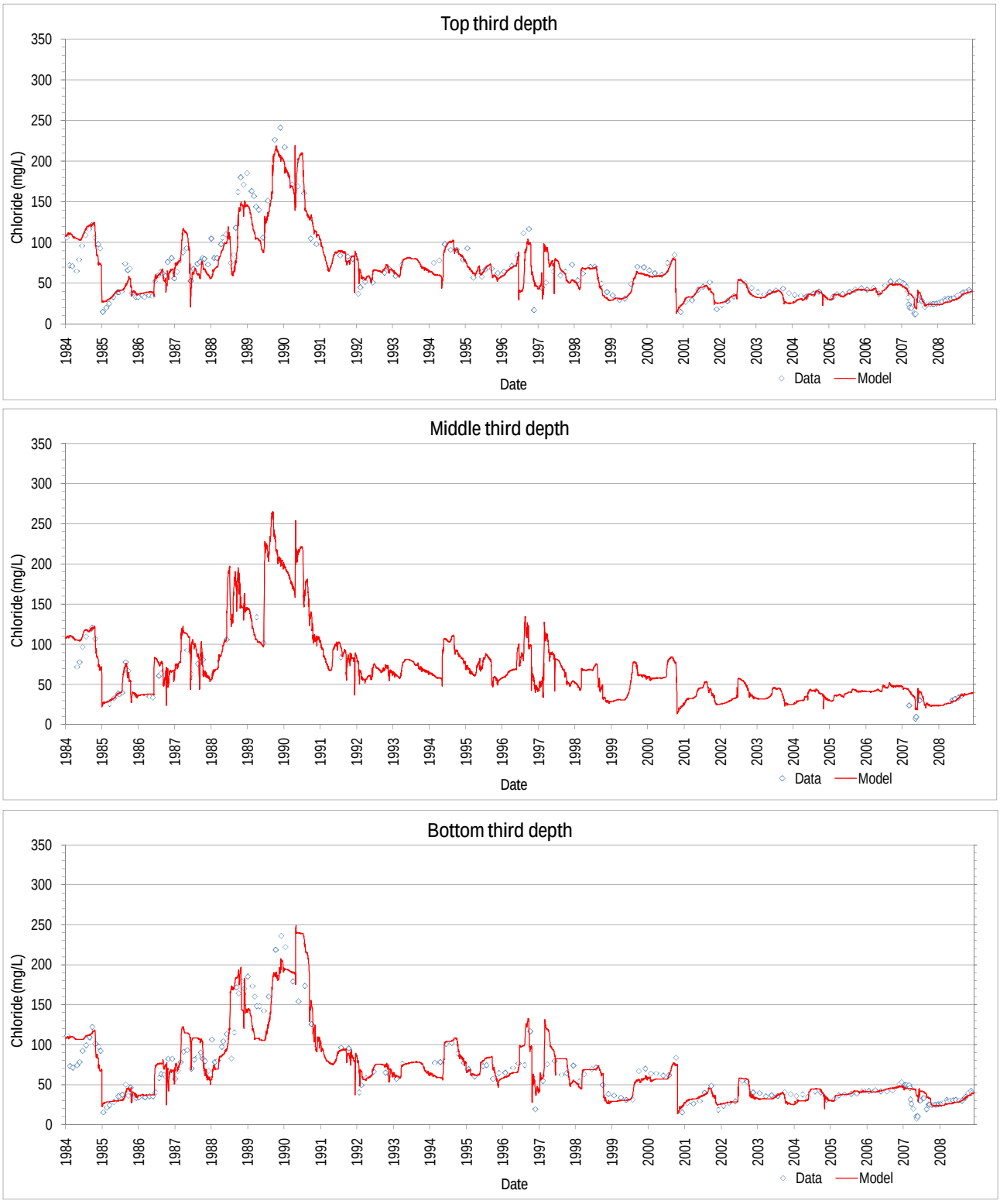


Figure 4-54 Temporal of Model versus Data for LBJ near Alvin Wirtz Dam (Segment 54) - Chloride

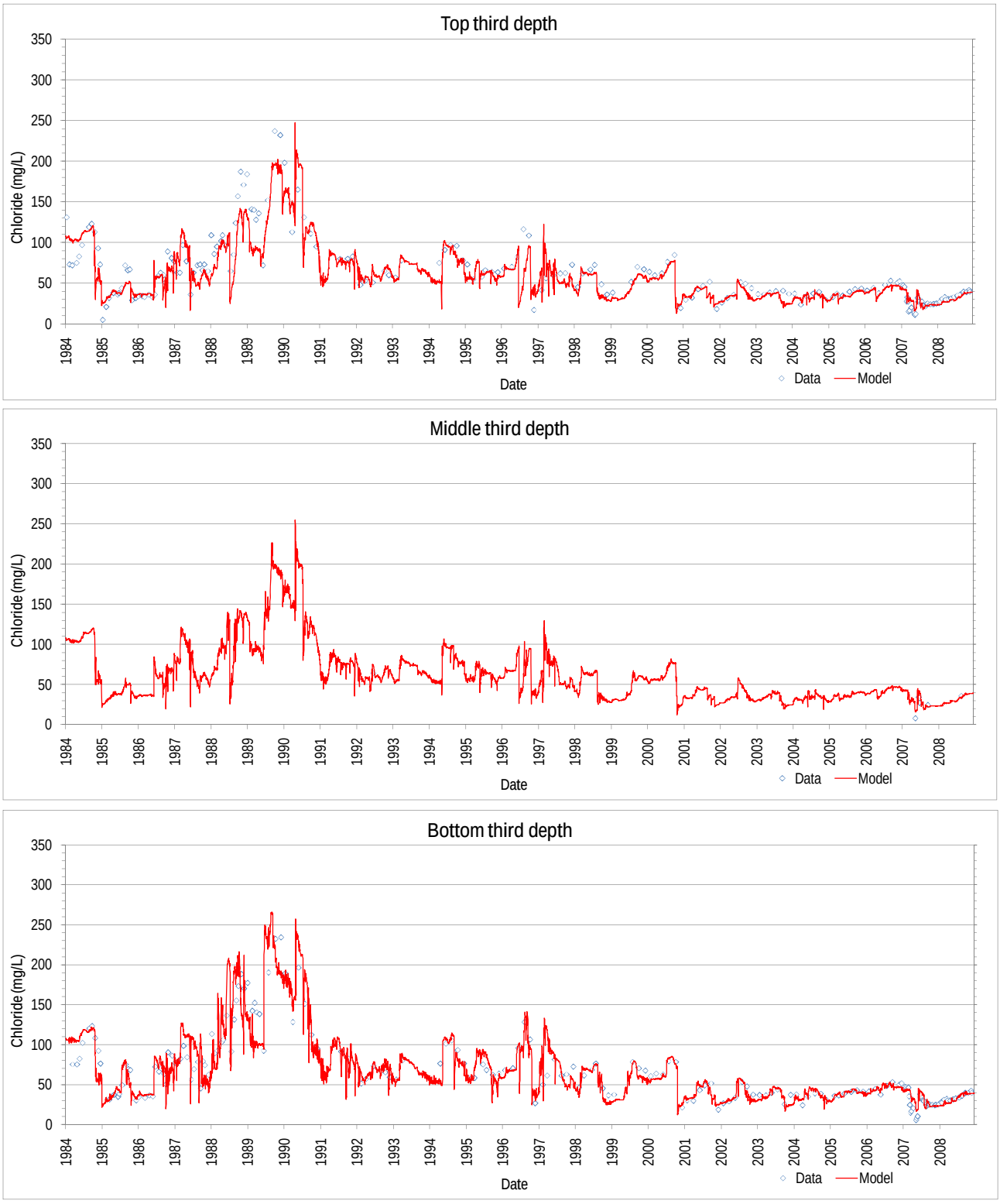


Figure 4-55 Temporal of Model versus Data for LBJ at Confluence with Sandy Creek Arm (Segment 41) - Chloride

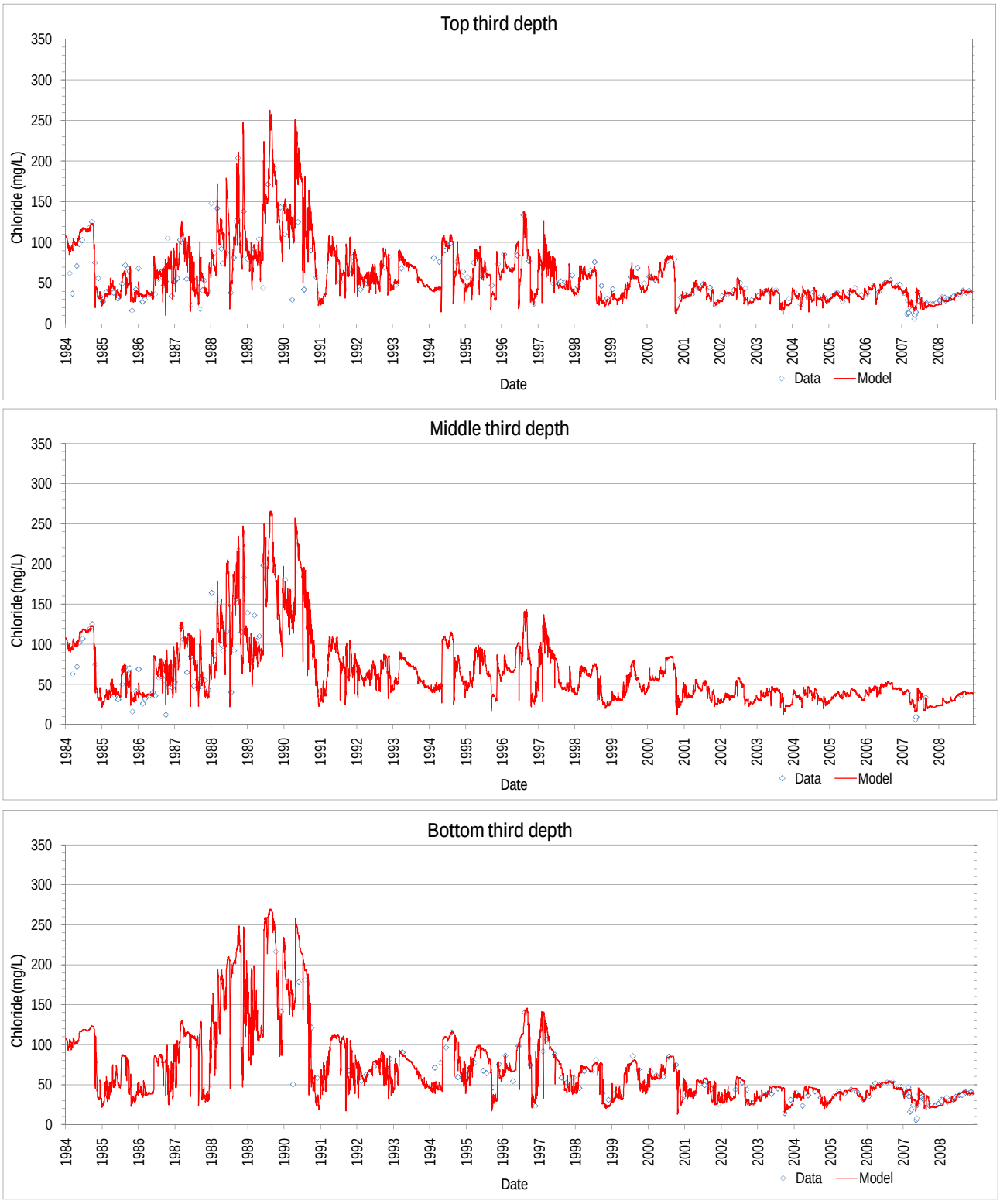


Figure 4-56 Temporal of Model versus Data for LBJ at Confluence with Llano River Arm (Segment 30) - Chloride

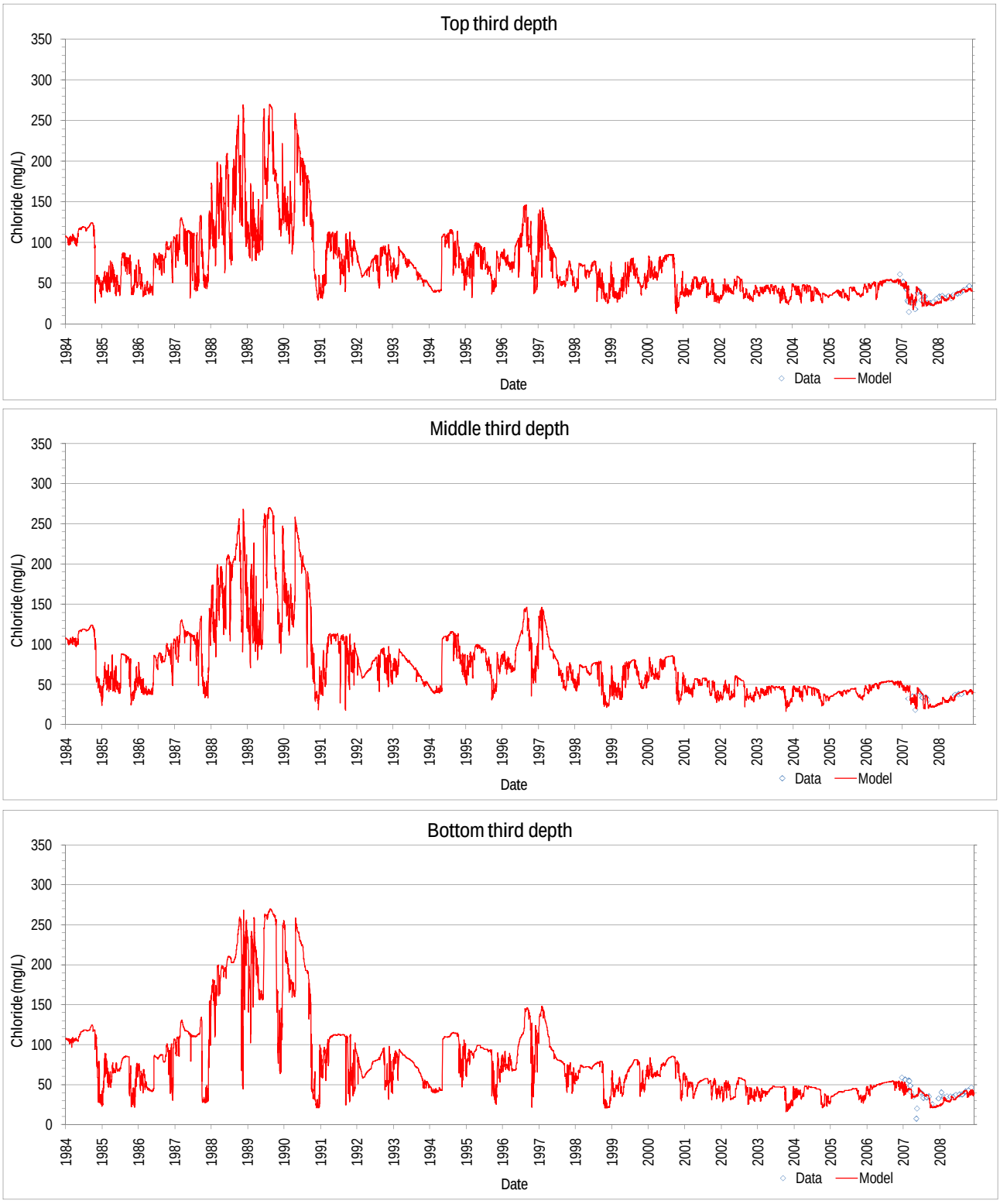


Figure 4-57 Temporal of Model versus Data for LBJ at Kingsland Cove (Segment 24) - Chloride

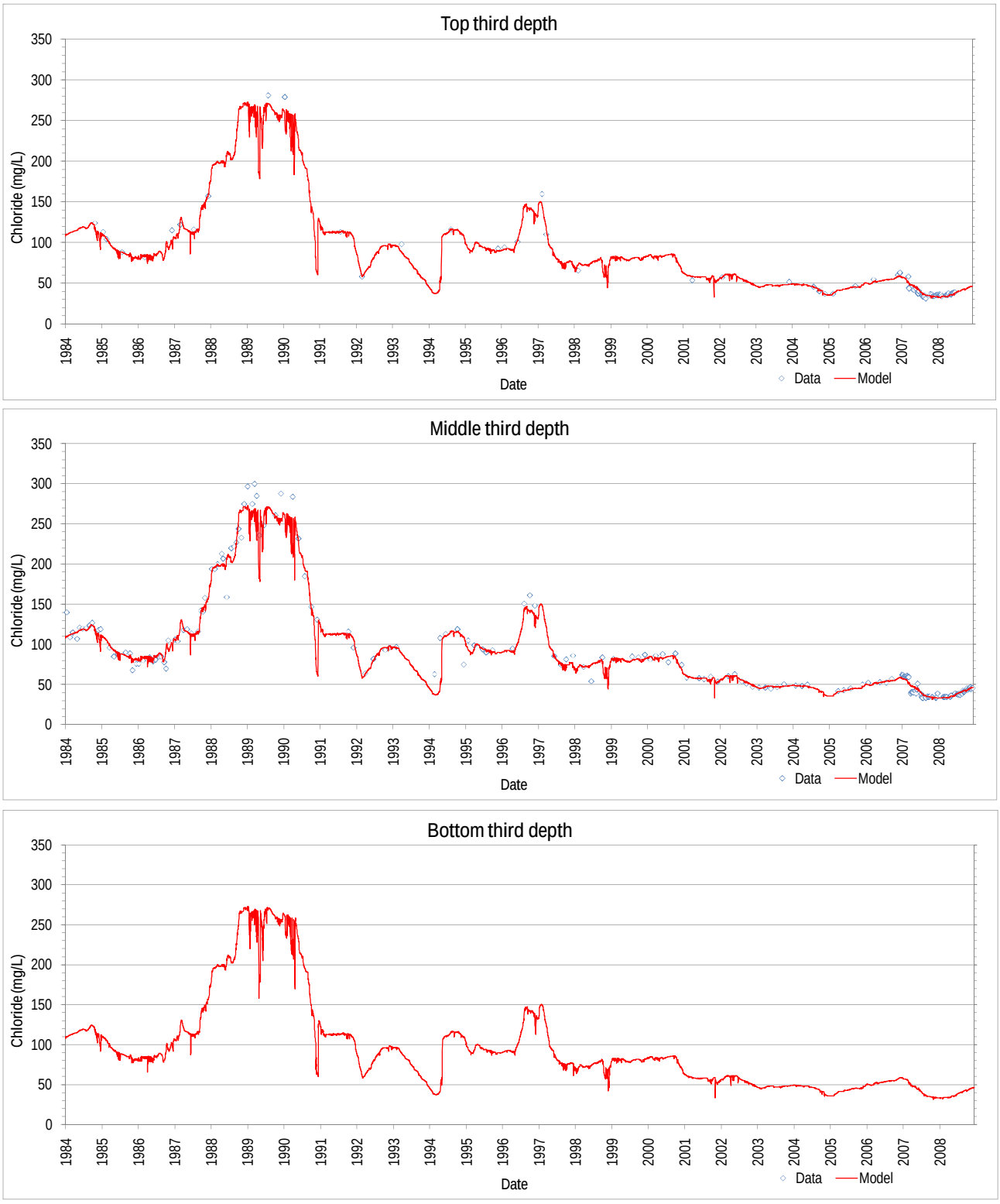


Figure 4-58 Temporal of Model versus Data for LBJ at Headwaters (Segment 2) - Chloride

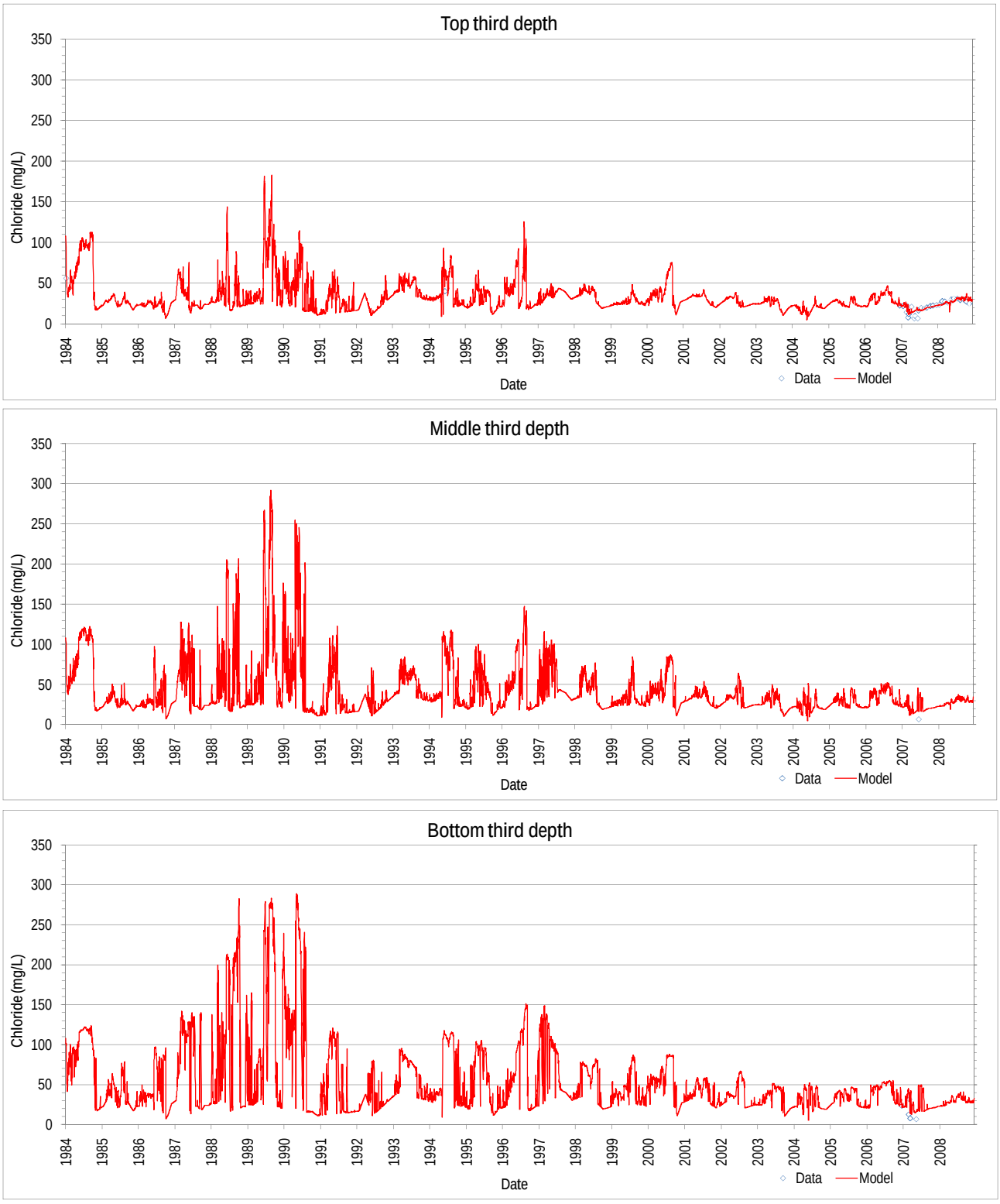


Figure 4-59 Temporal of Model versus Data for LBJ at FM 2900 (Segment 62) - Chloride

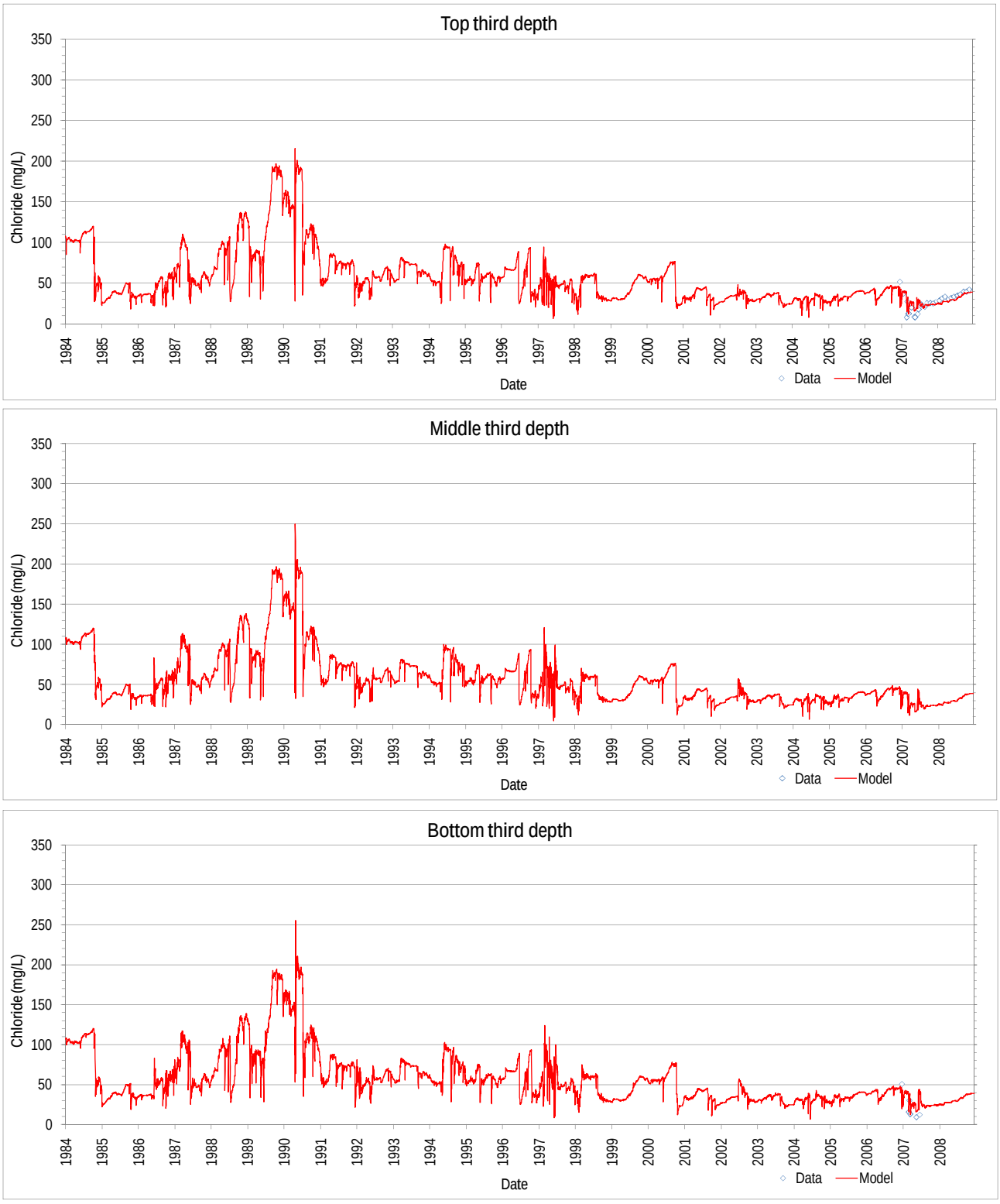


Figure 4-60 Temporal of Model versus Data for LBJ near Lake Shore Drive (Segment 78) - Chloride

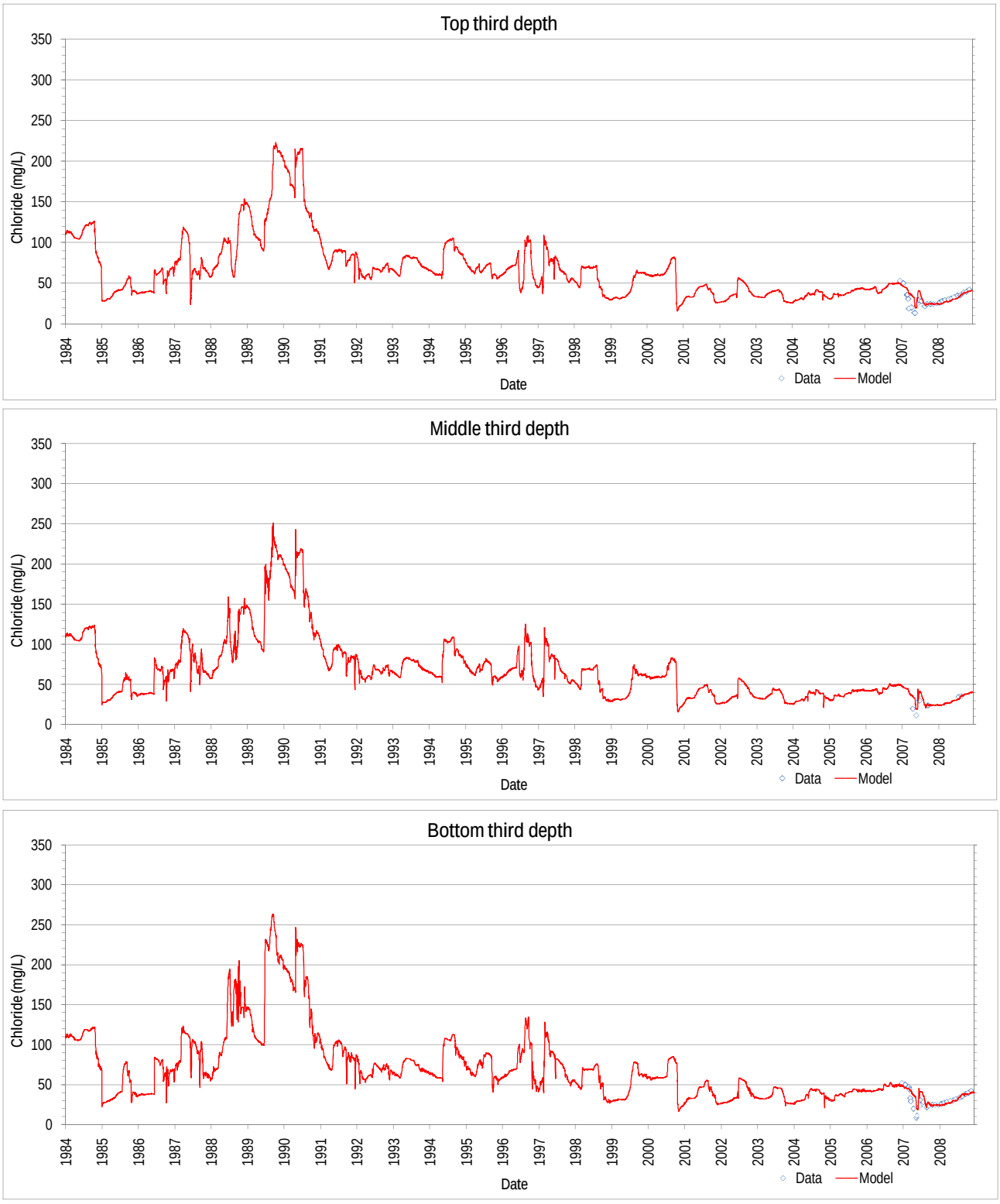


Figure 4-61 Temporal of Model versus Data for LBJ at Horseshoe Bay Cove (Segment 100) - Chloride

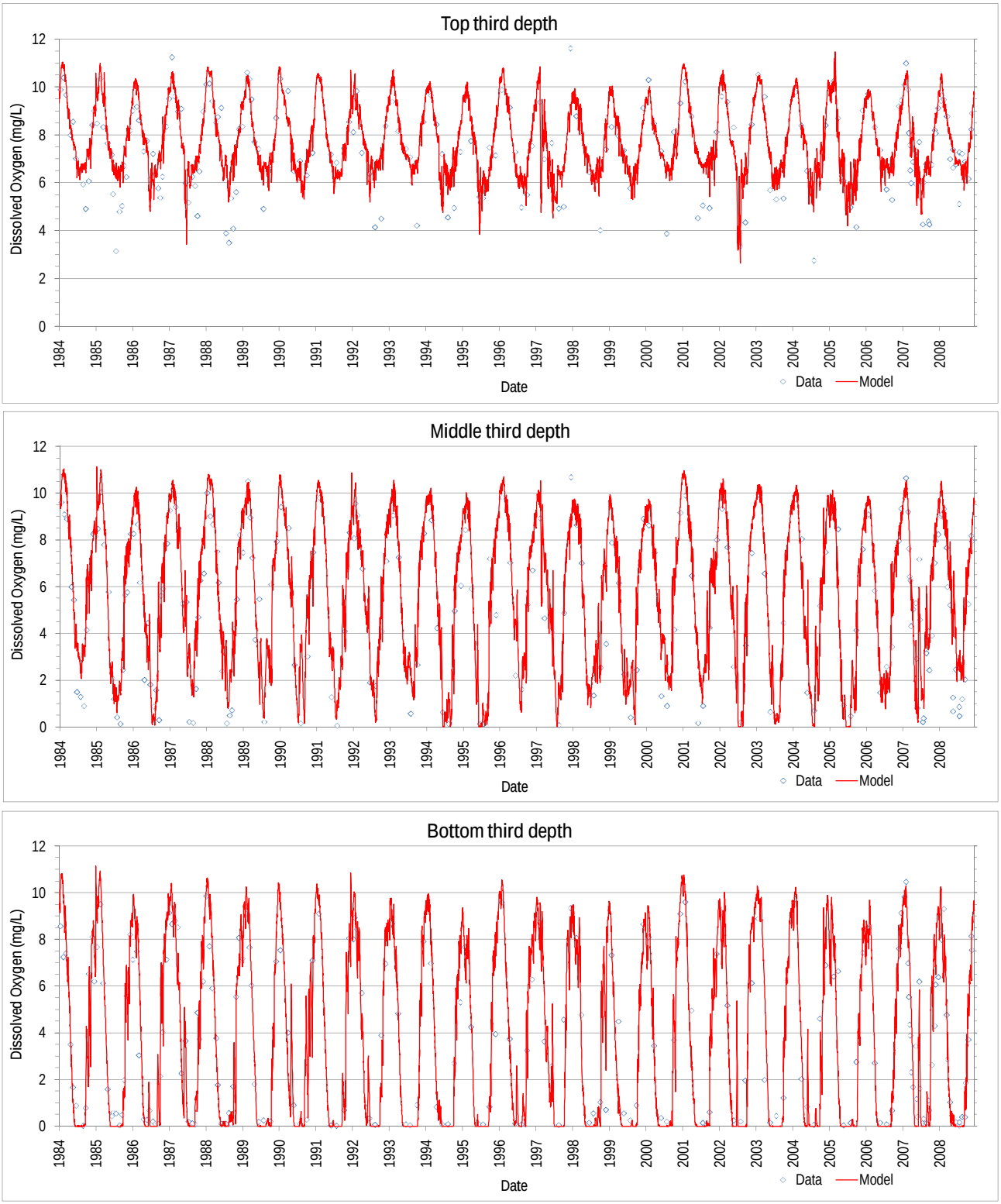


Figure 4-62 Temporal of Model versus Data for LBJ near Alvin Wirtz Dam (Segment 54) - Dissolved Oxygen

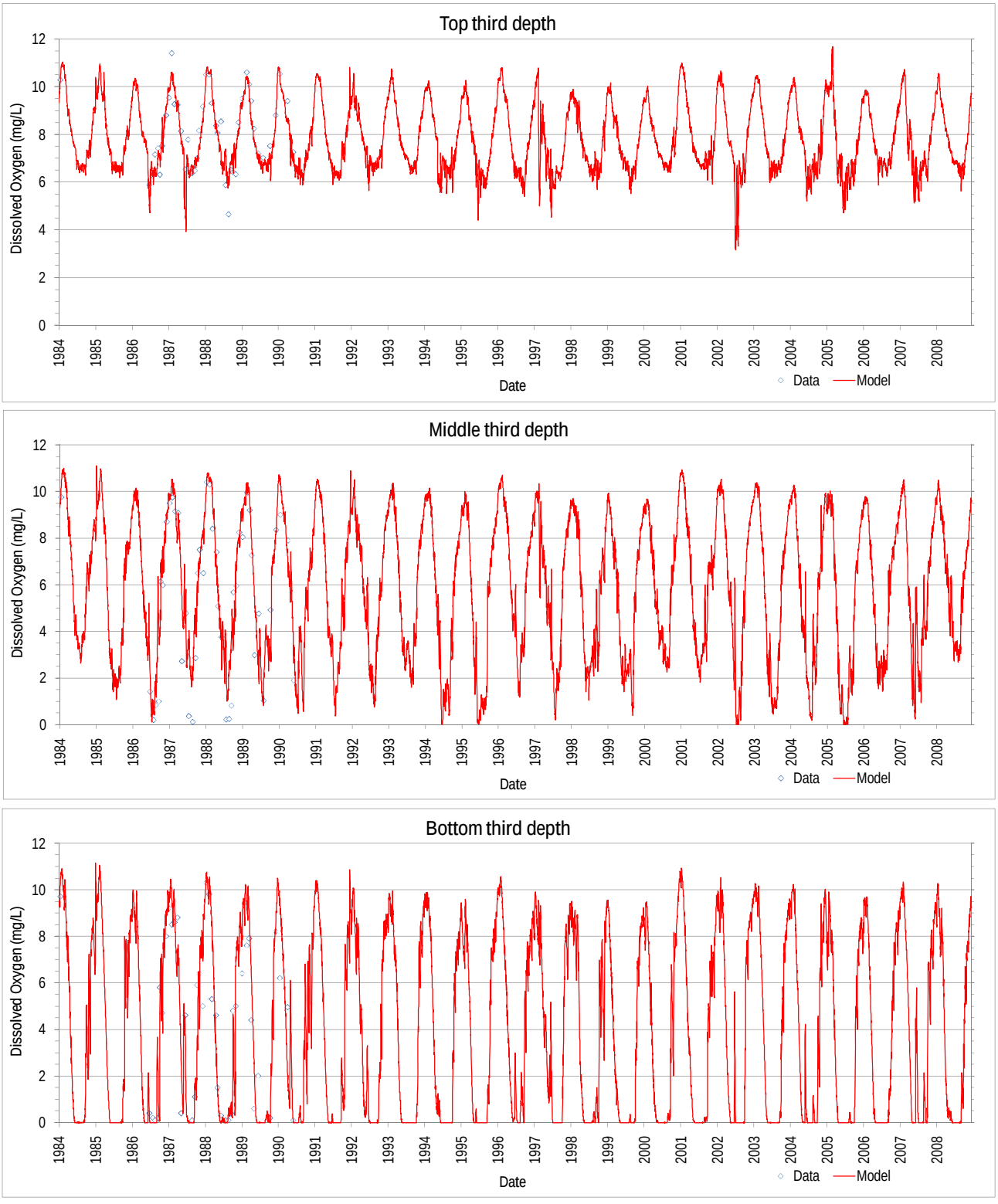


Figure 4-63 Temporal of Model versus Data for LBJ at the Narrows (Segment 53) - Dissolved Oxygen

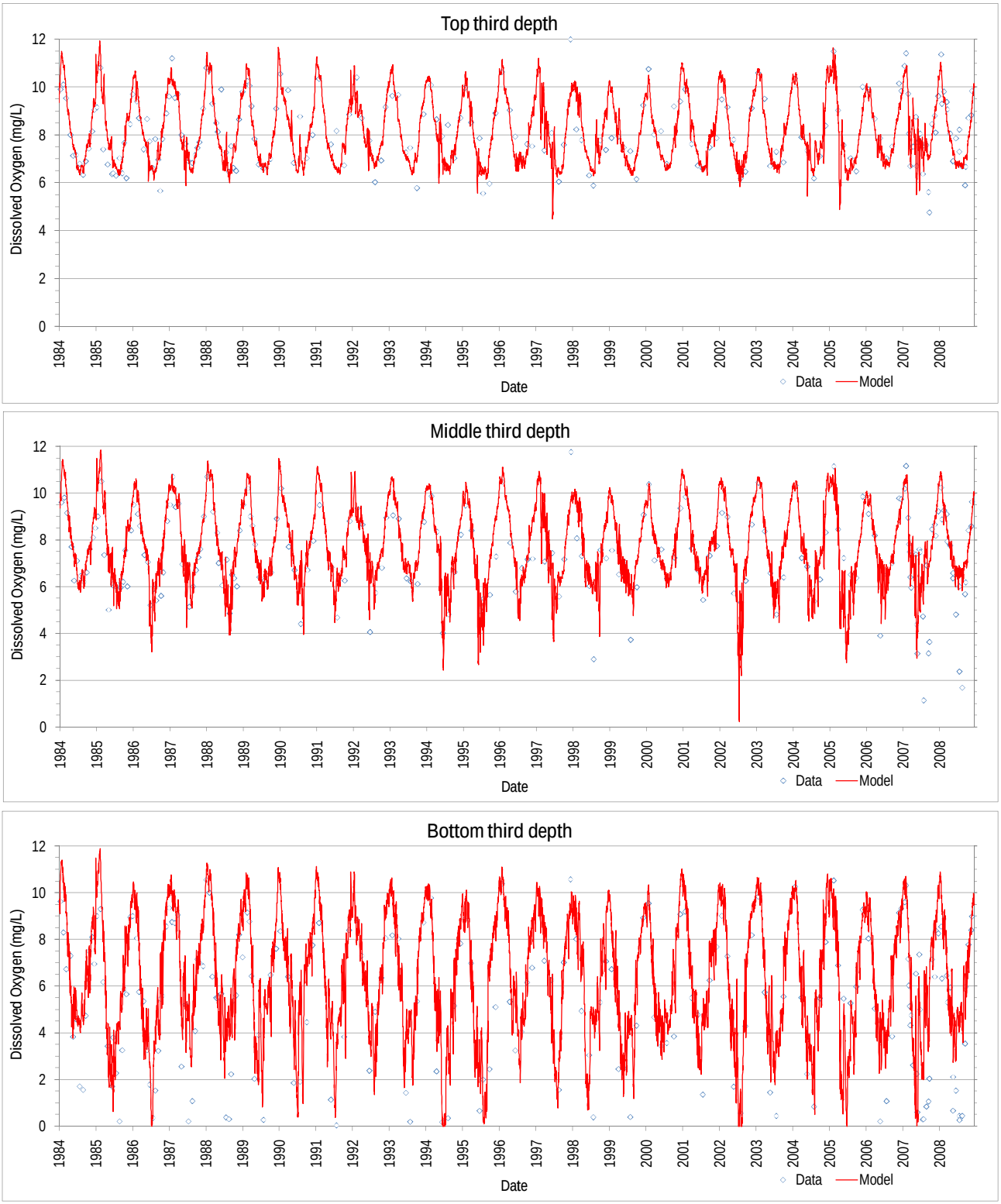


Figure 4-64 Temporal of Model versus Data for LBJ at Confluence with Sandy Creek Arm (Segment 41) - Dissolved Oxygen

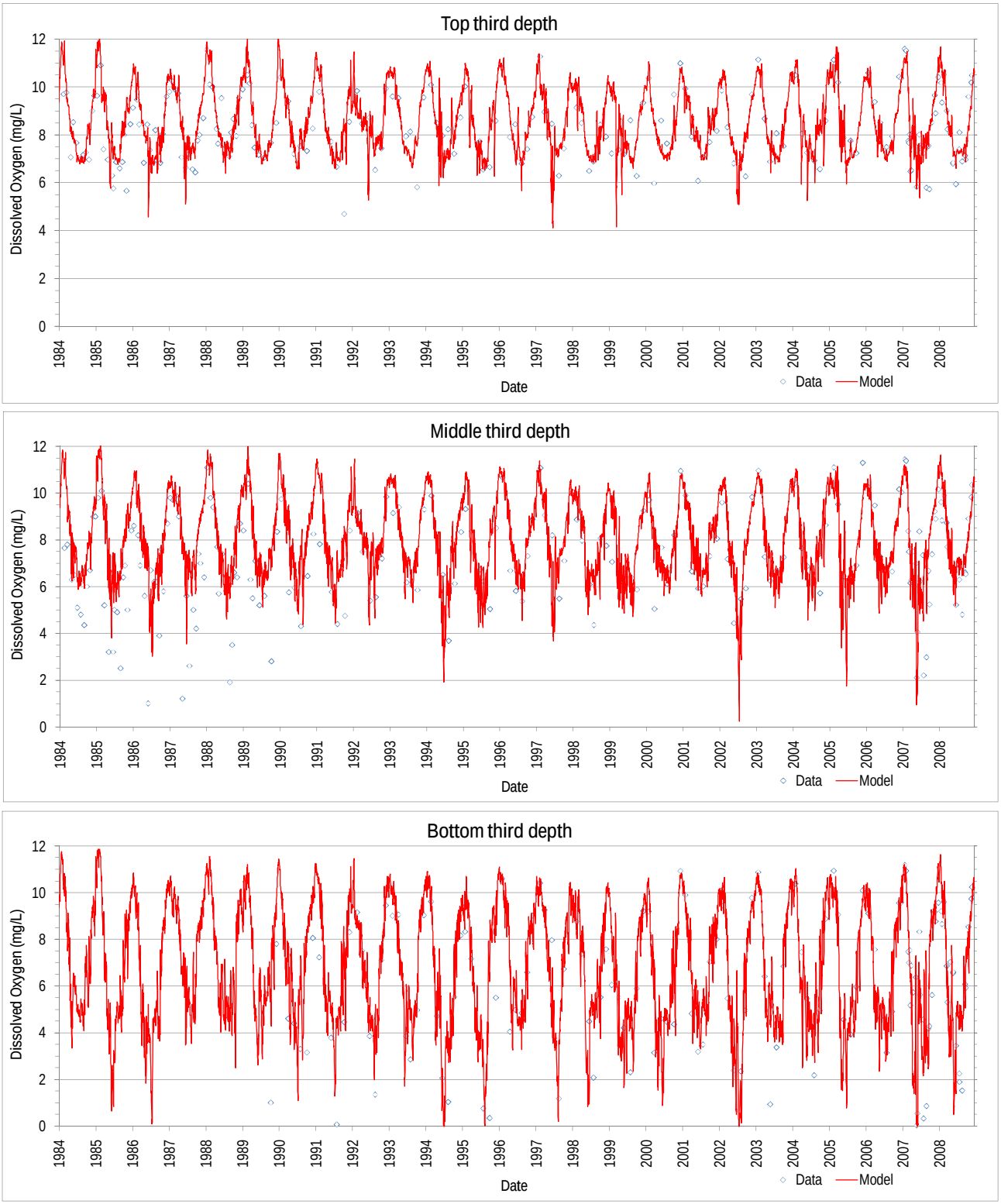


Figure 4-65 Temporal of Model versus Data for LBJ at Confluence with Llano River Arm (Segment 30) - Dissolved Oxygen

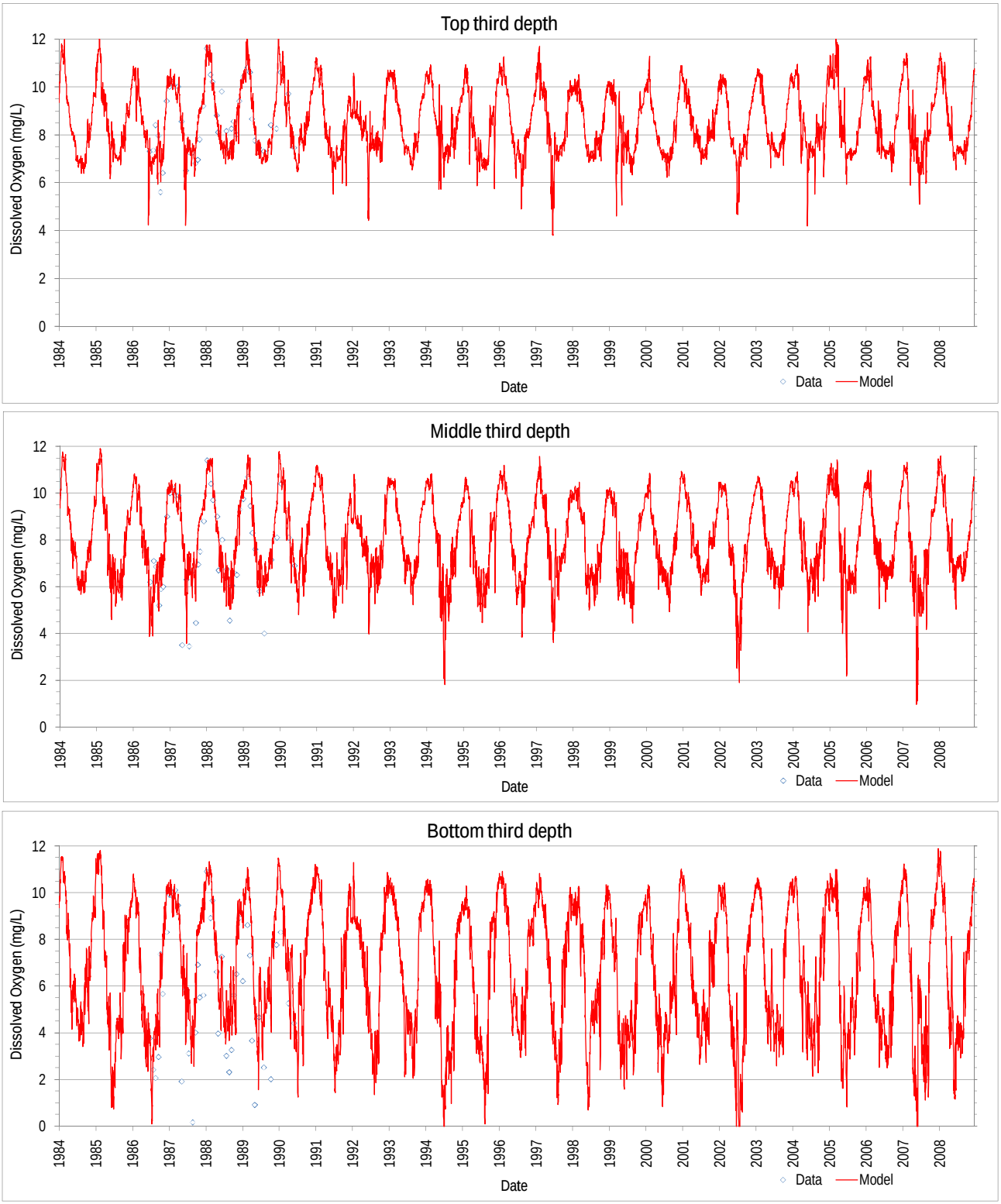


Figure 4-66 Temporal of Model versus Data for LBJ at FM 1431 (Segment 26) - Dissolved Oxygen

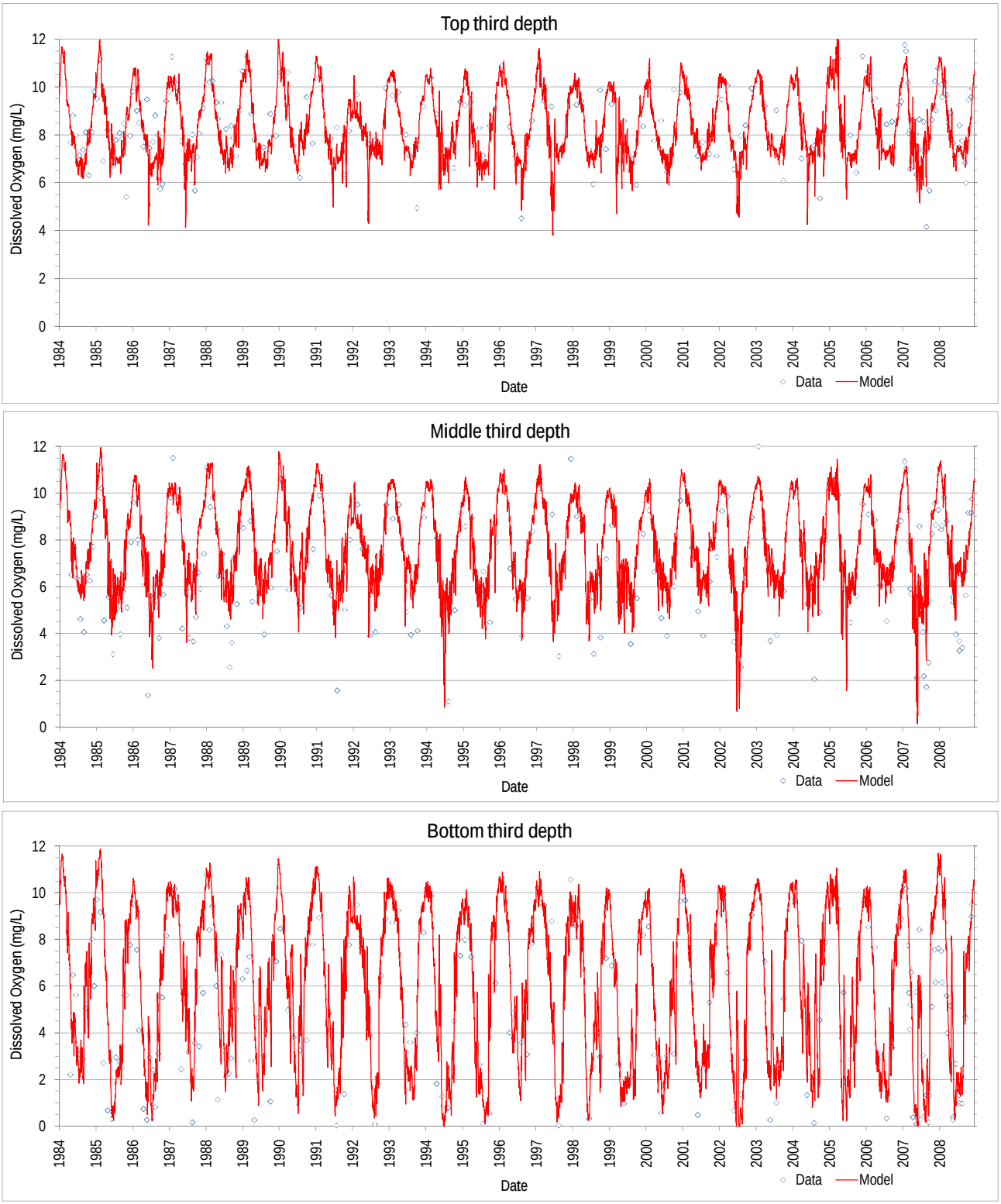


Figure 4-67 Temporal of Model versus Data for LBJ at Kingsland Cove (Segment 24) - Dissolved Oxygen

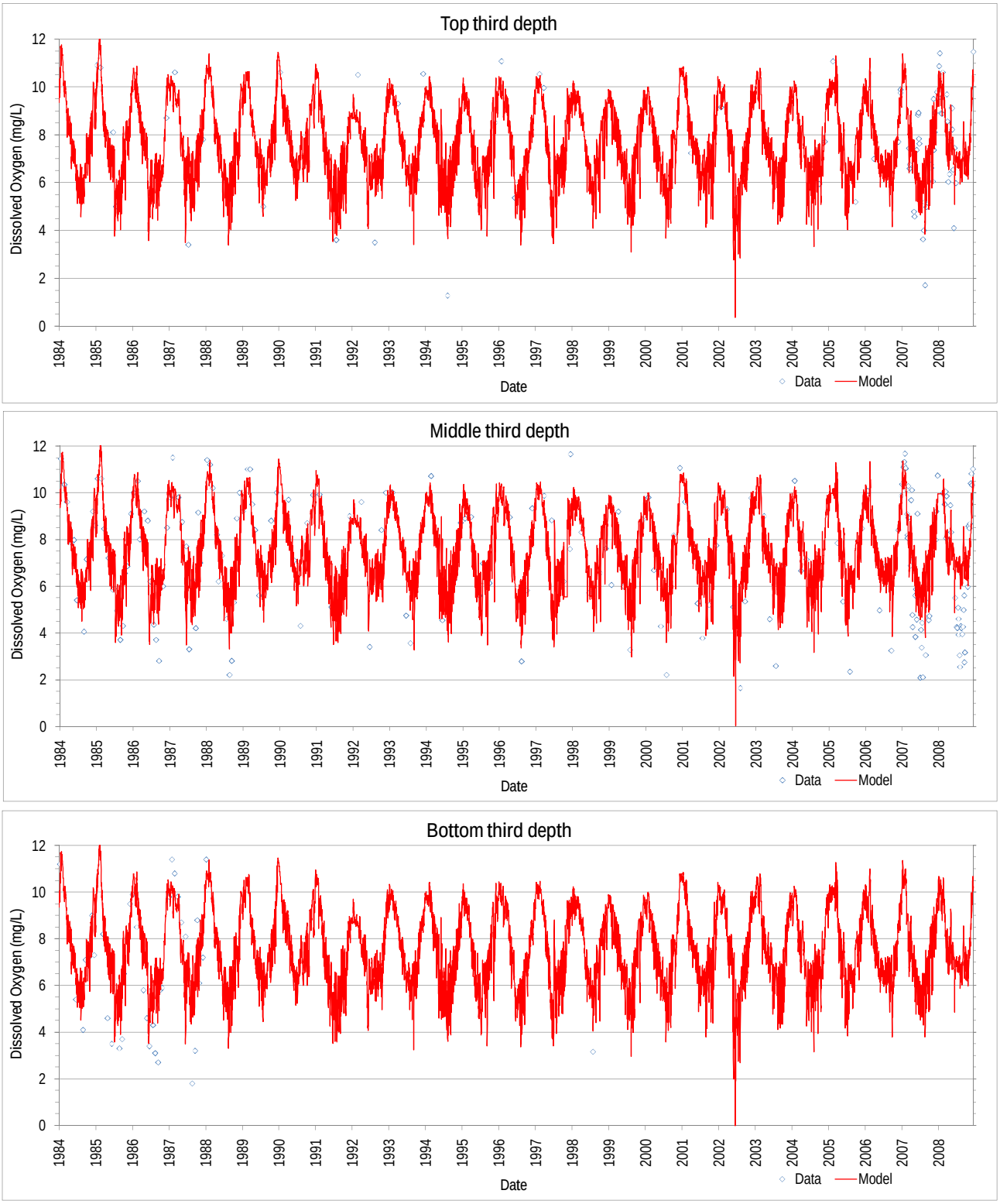


Figure 4-68 Temporal of Model versus Data for LBJ at Headwaters (Segment 2) - Dissolved Oxygen

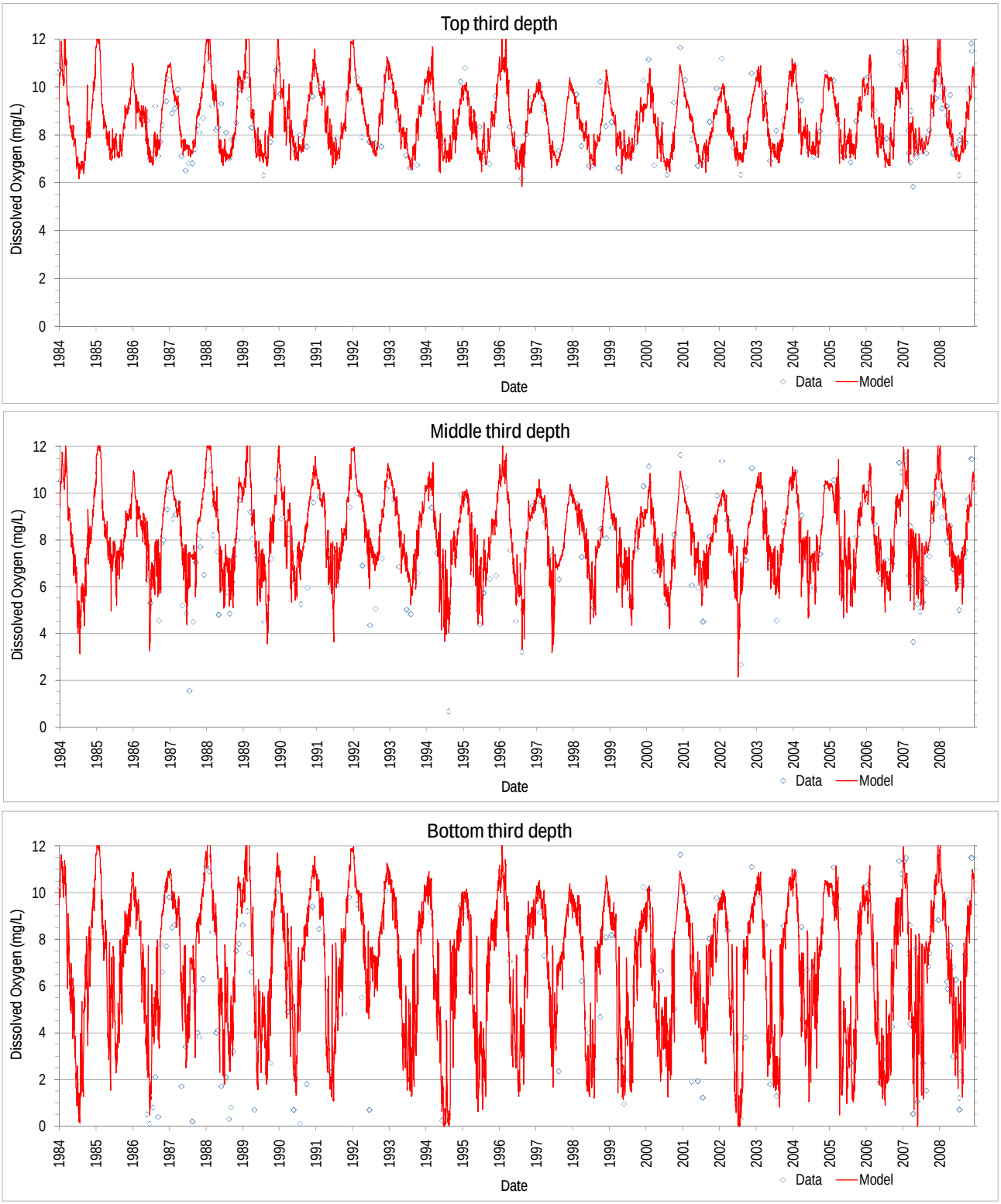


Figure 4-69 Temporal of Model versus Data for LBJ at FM 2900 (Segment 62) - Dissolved Oxygen

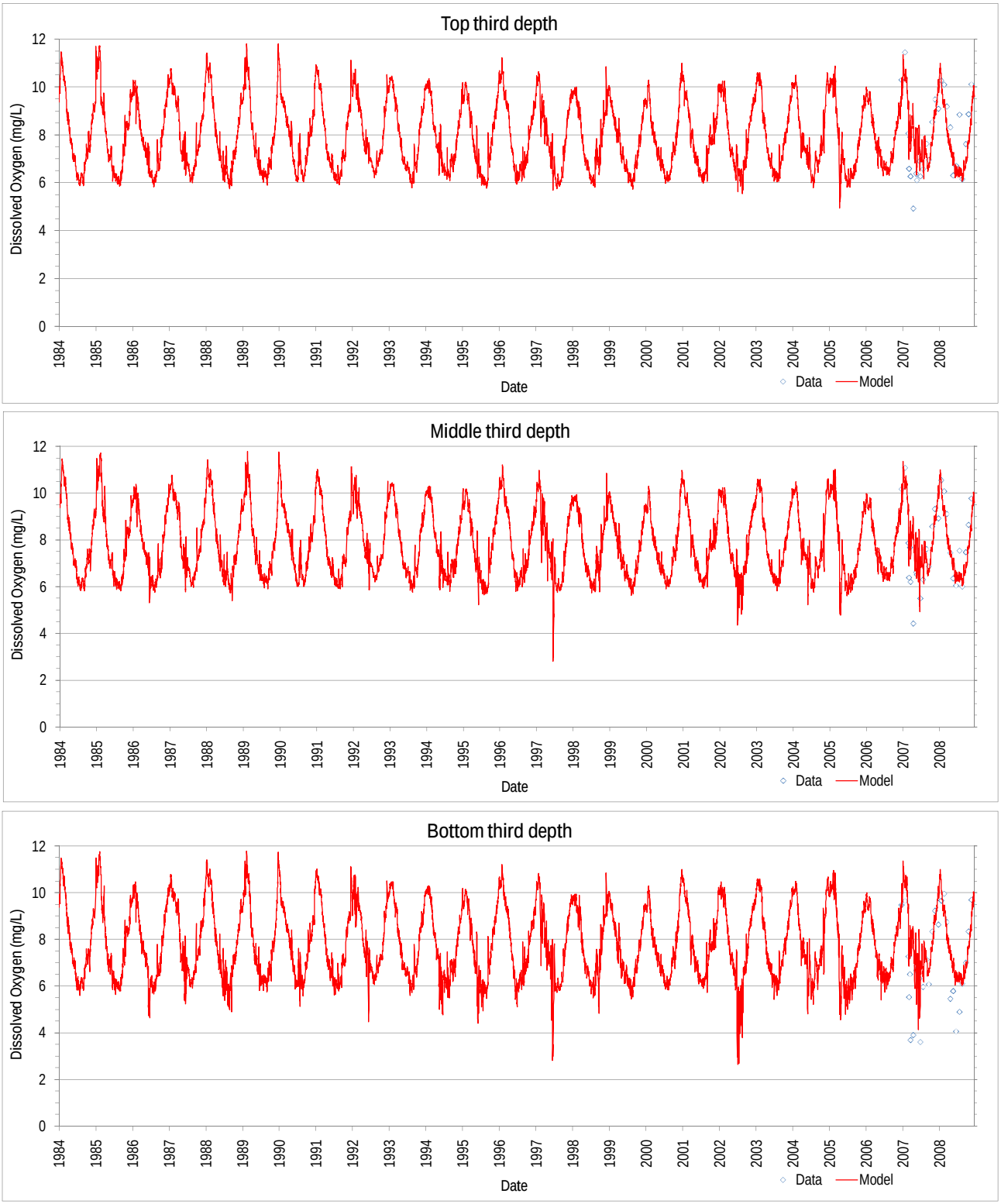


Figure 4-70 Temporal of Model versus Data for LBJ near Lake Shore Drive (Segment 78) - Dissolved Oxygen

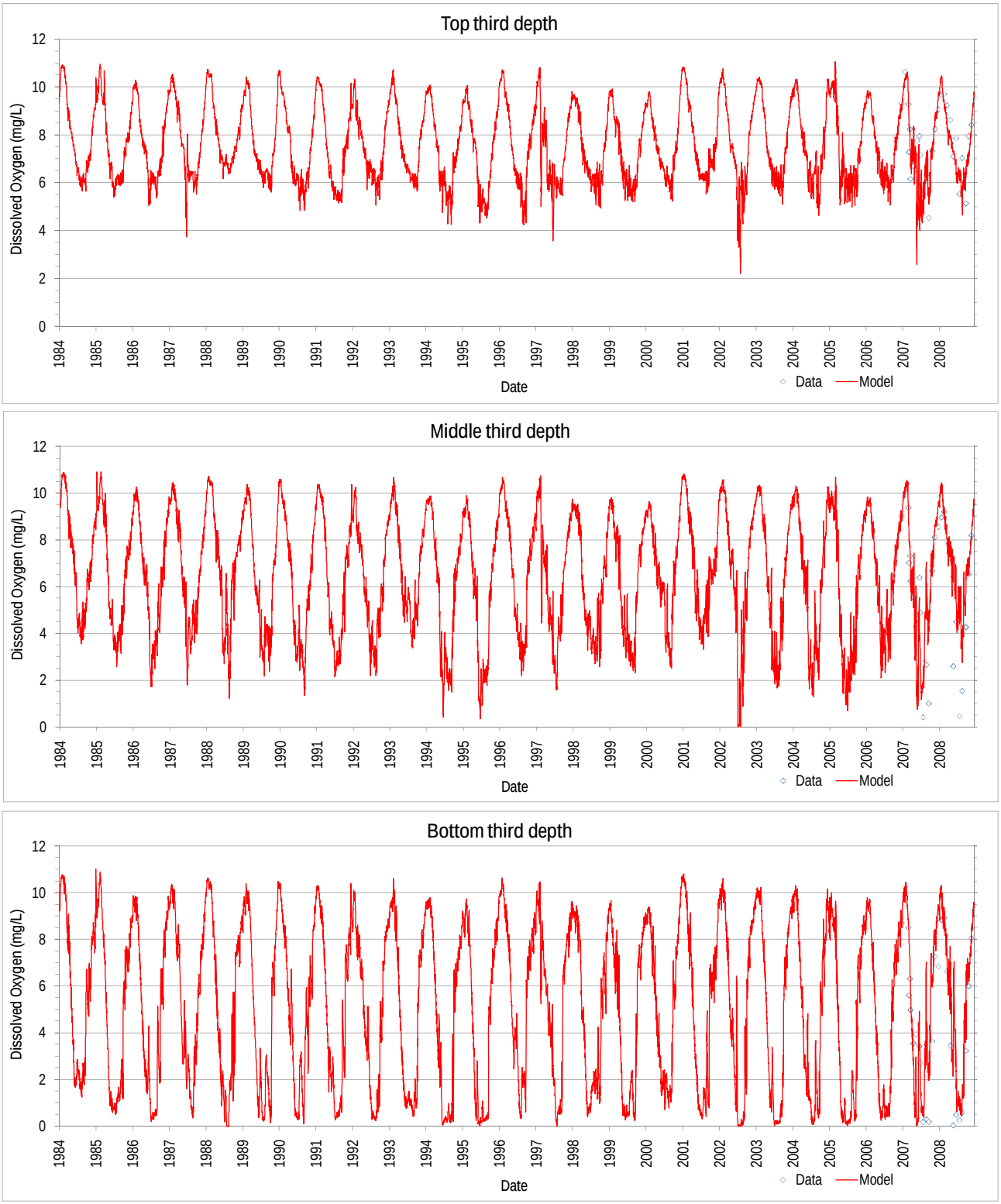


Figure 4-71 Temporal of Model versus Data for LBJ at Horseshoe Bay Cove (Segment 100) - Dissolved Oxygen

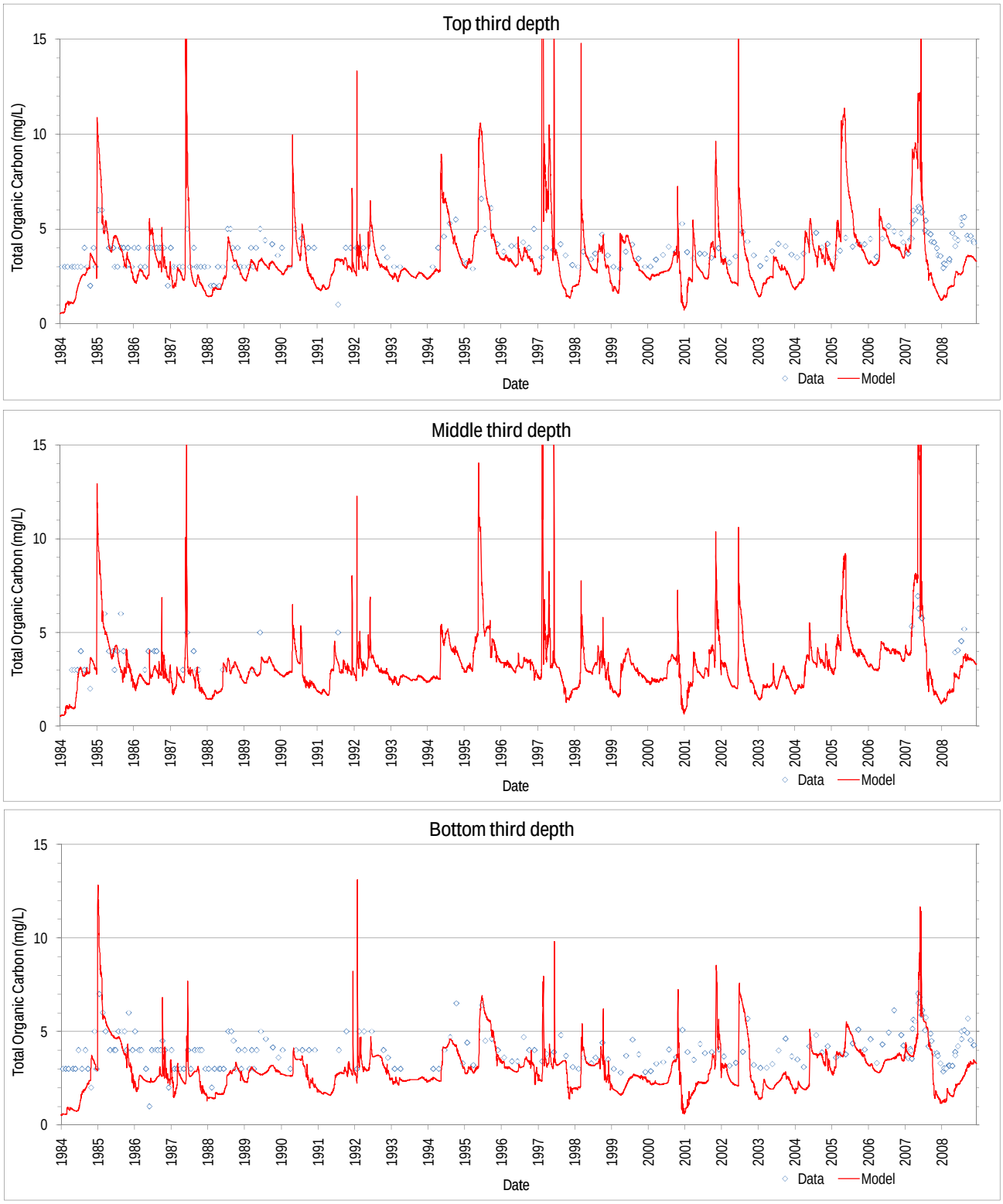


Figure 4-72 Temporal of Model versus Data for LBJ near Alvin Wirtz Dam (Segment 54) - Total Organic Carbon

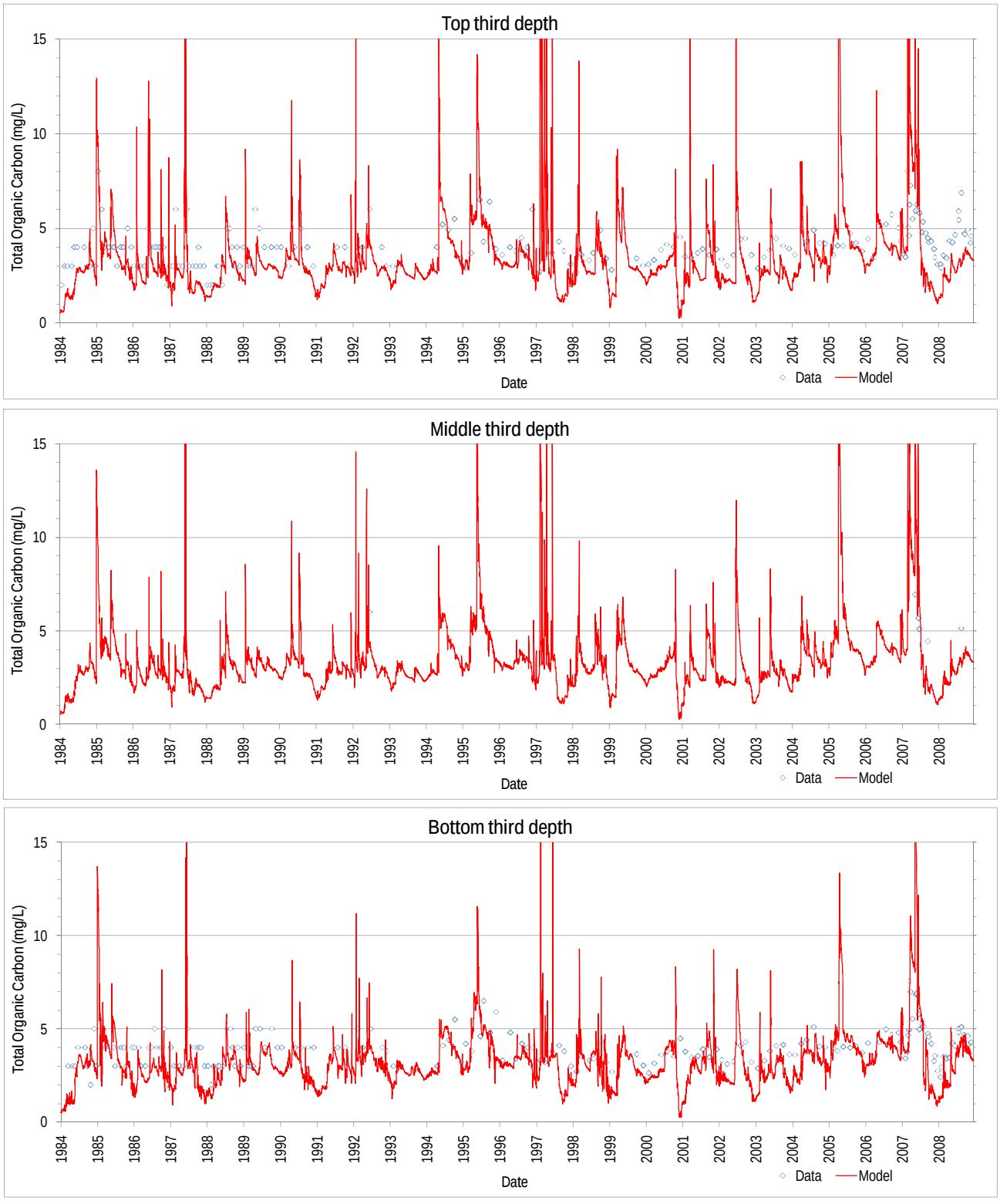


Figure 4-73 Temporal of Model versus Data for LBJ at Confluence with Sandy Creek Arm (Segment 41) - Total Organic Carbon

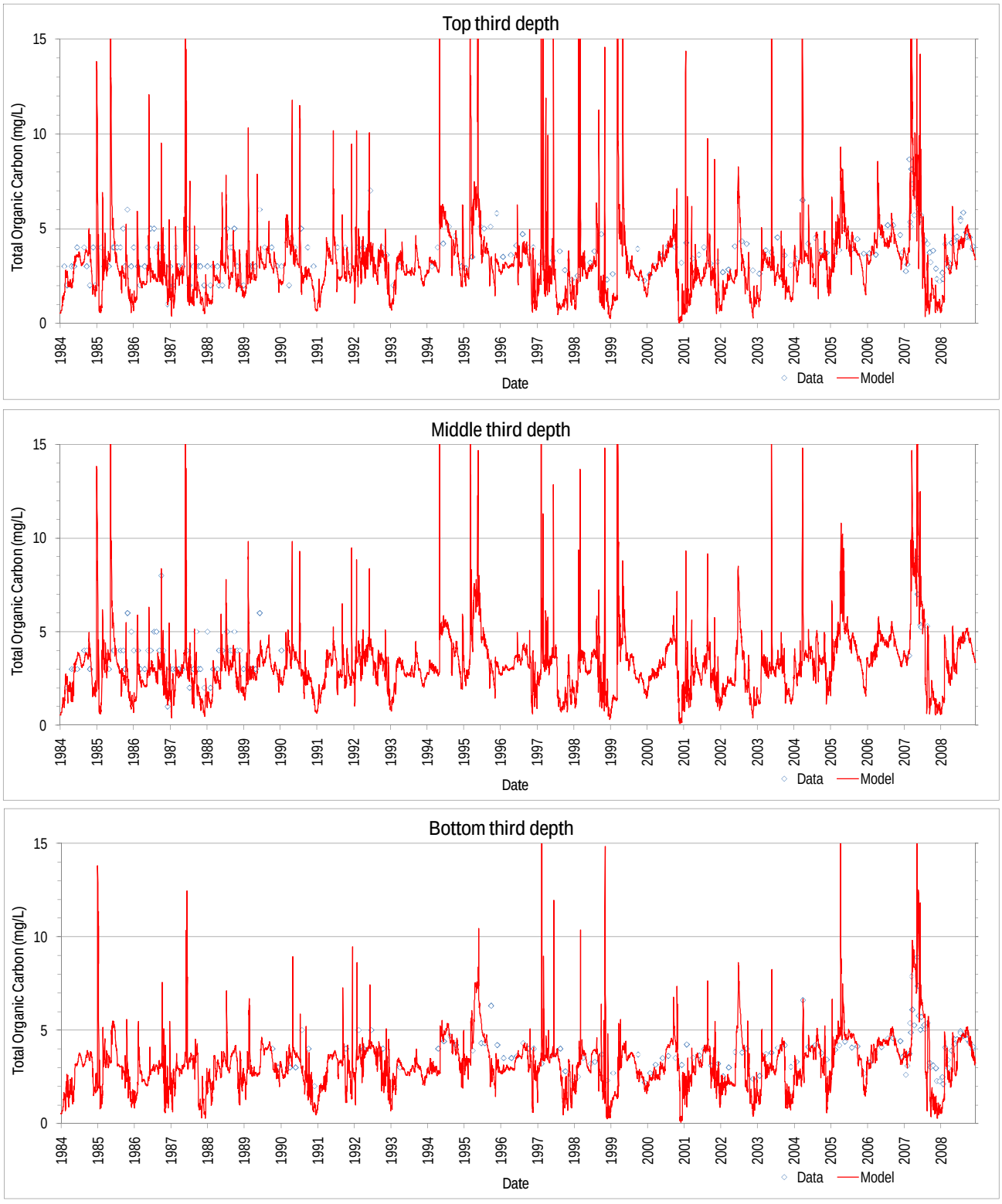


Figure 4-74 Temporal of Model versus Data for LBJ at Confluence with Llano River Arm (Segment 30) - Total Organic Carbon

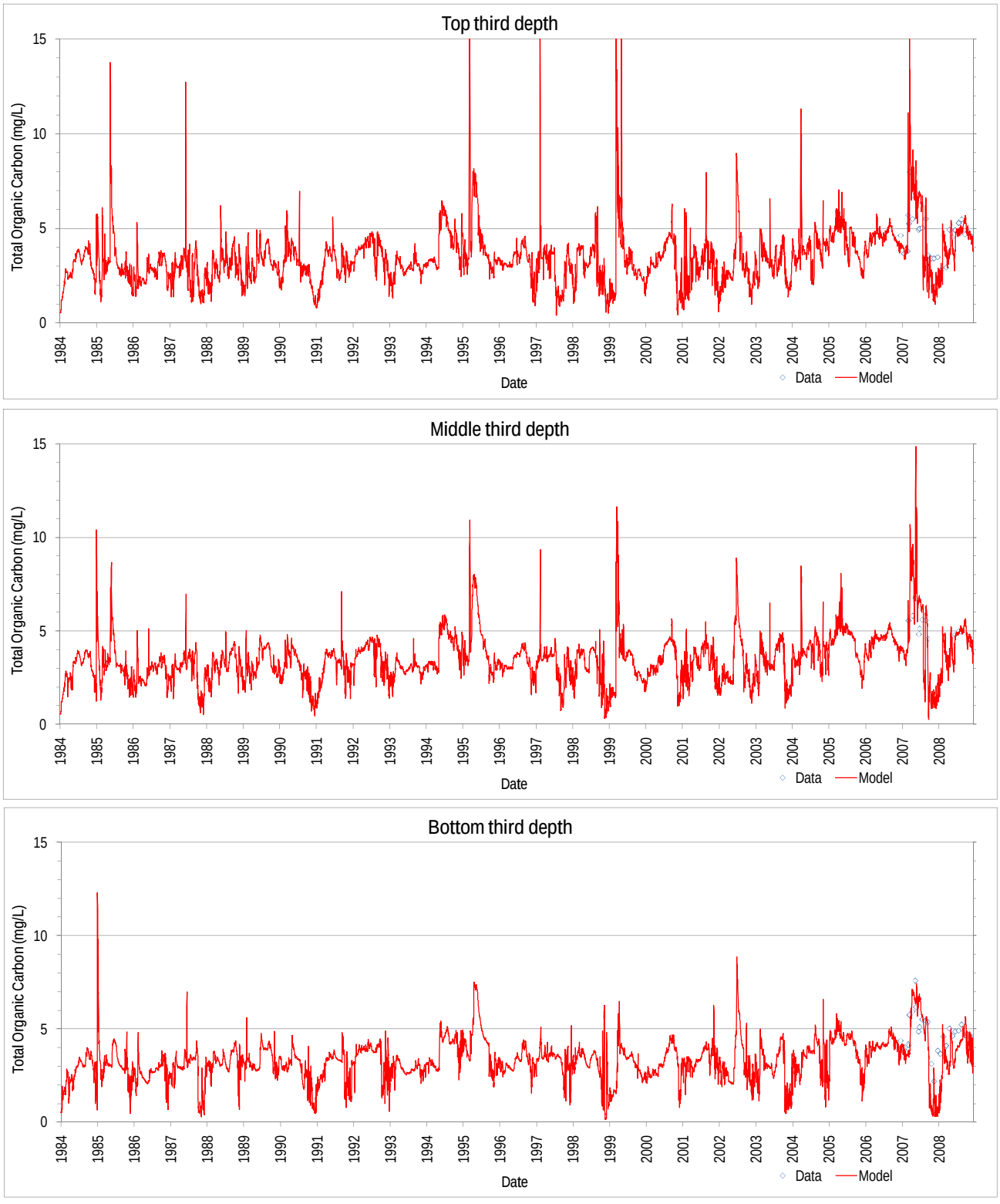


Figure 4-75 Temporal of Model versus Data for LBJ at Kingsland Cove (Segment 24) - Total Organic Carbon

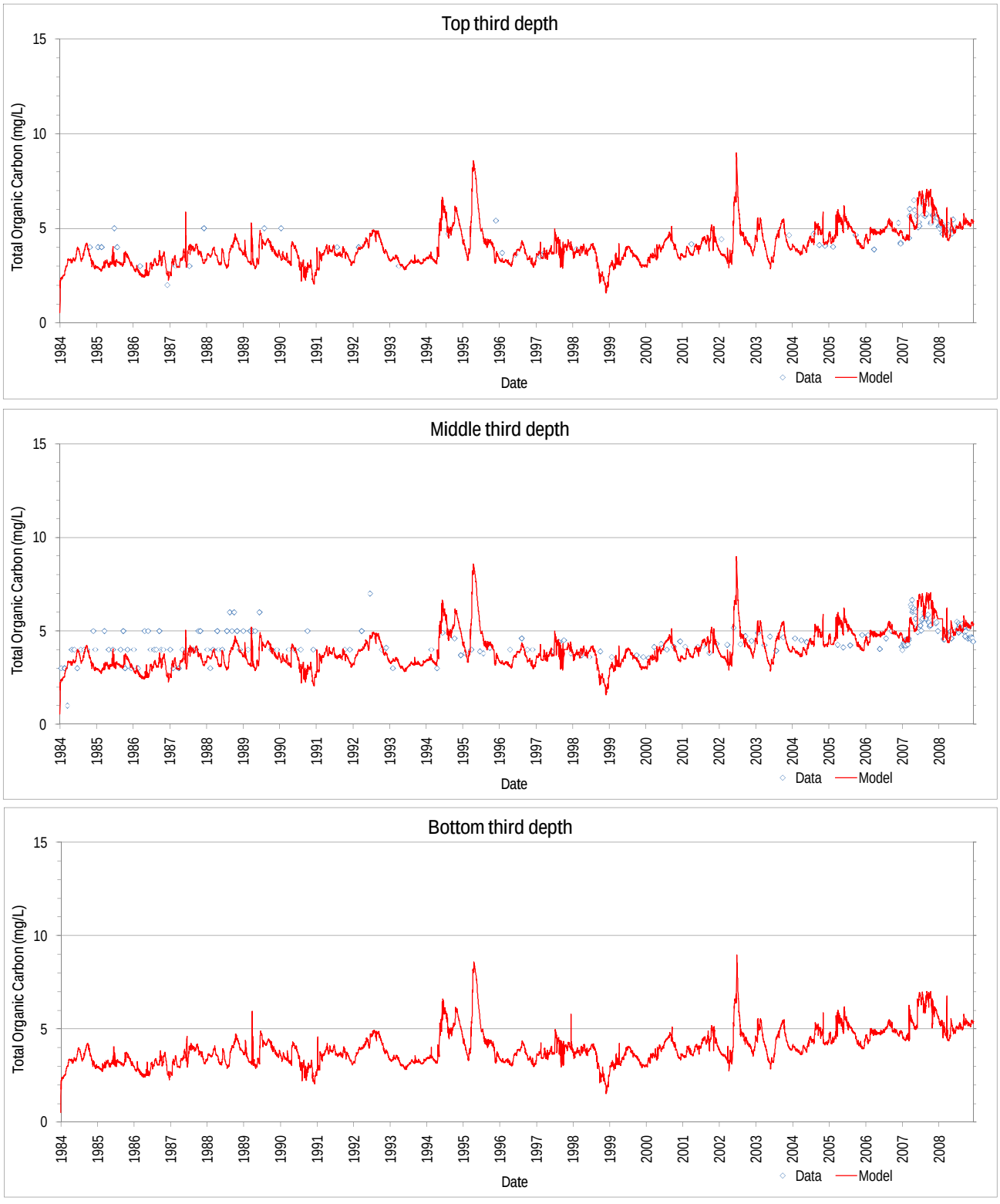


Figure 4-76 Temporal of Model versus Data for LBJ at Headwaters (Segment 2) - Total Organic Carbon

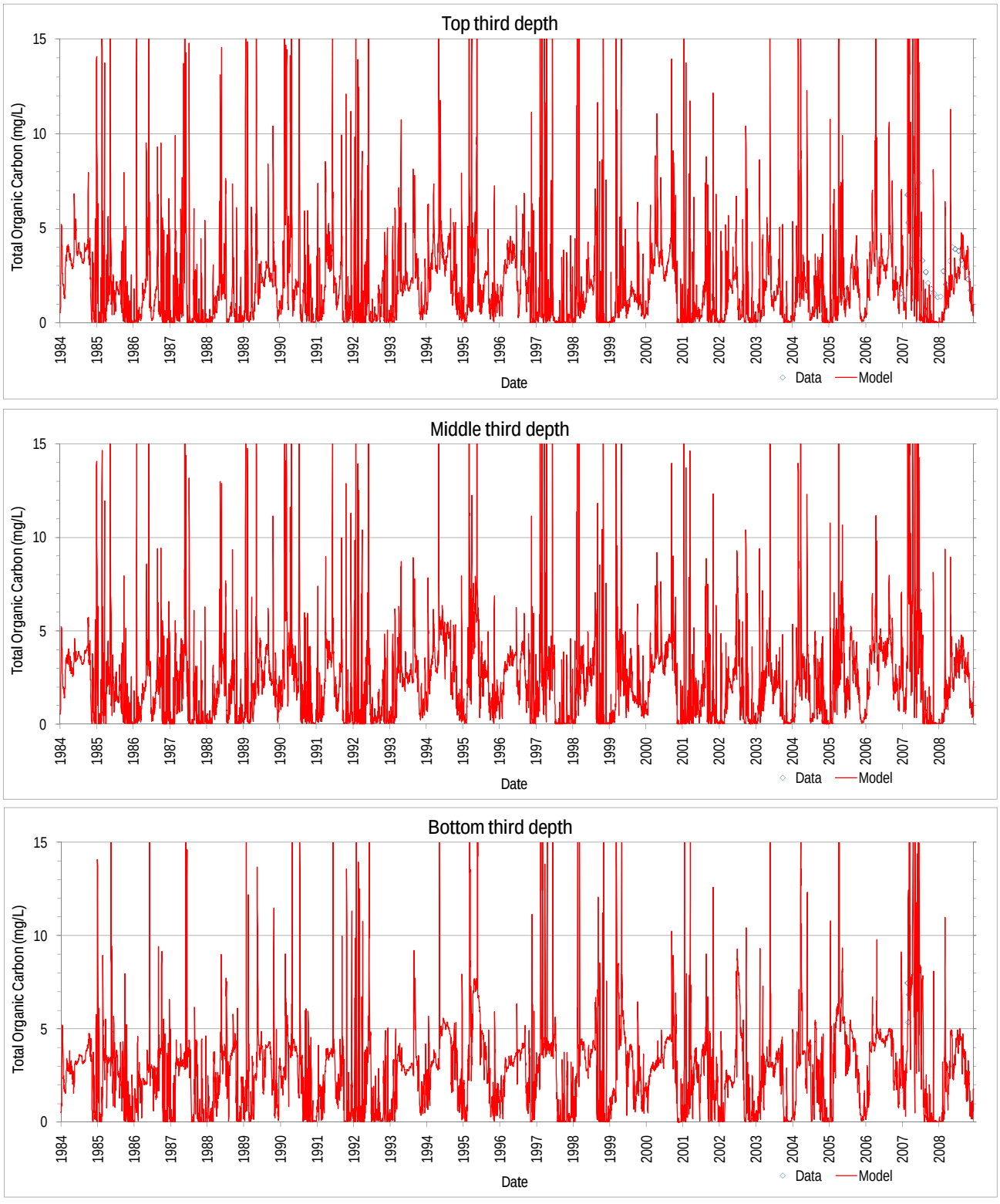


Figure 4-77 Temporal of Model versus Data for LBJ at FM 2900 (Segment 62) - Total Organic Carbon

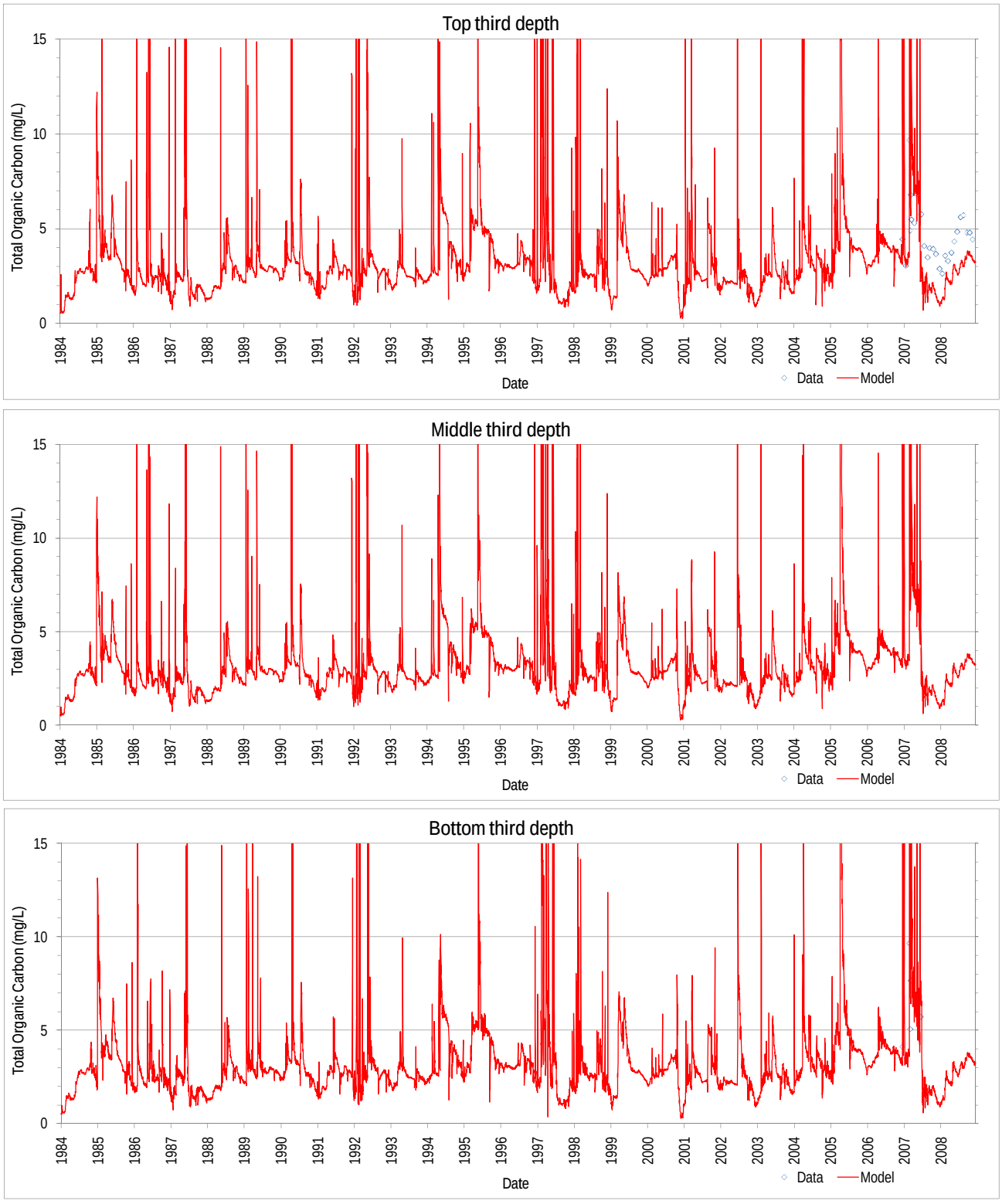


Figure 4-78 Temporal of Model versus Data for LBJ near Lake Shore Drive (Segment 78) - Total Organic Carbon

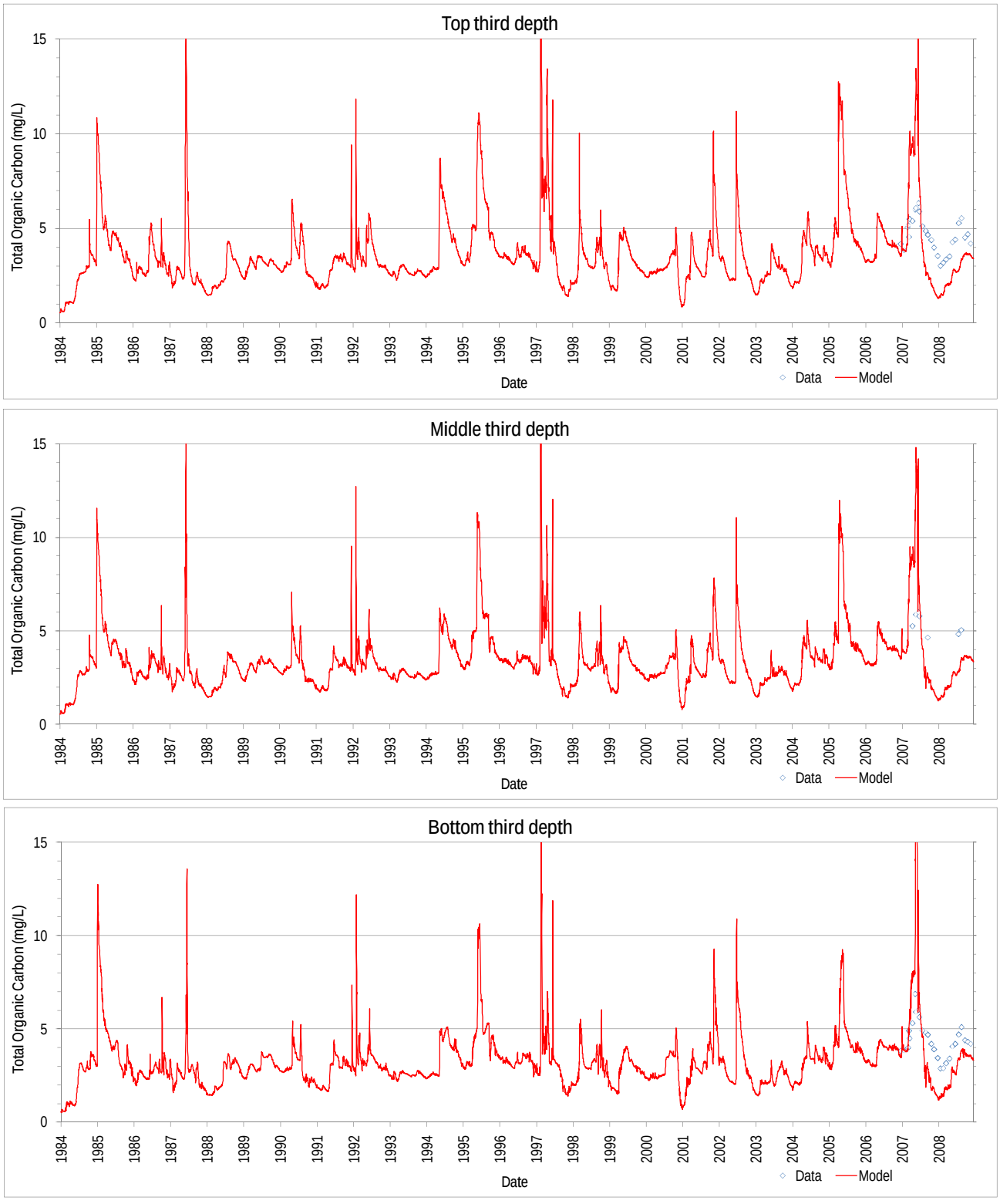


Figure 4-79 Temporal of Model versus Data for LBJ at Horseshoe Bay Cove (Segment 100) - Total Organic Carbon

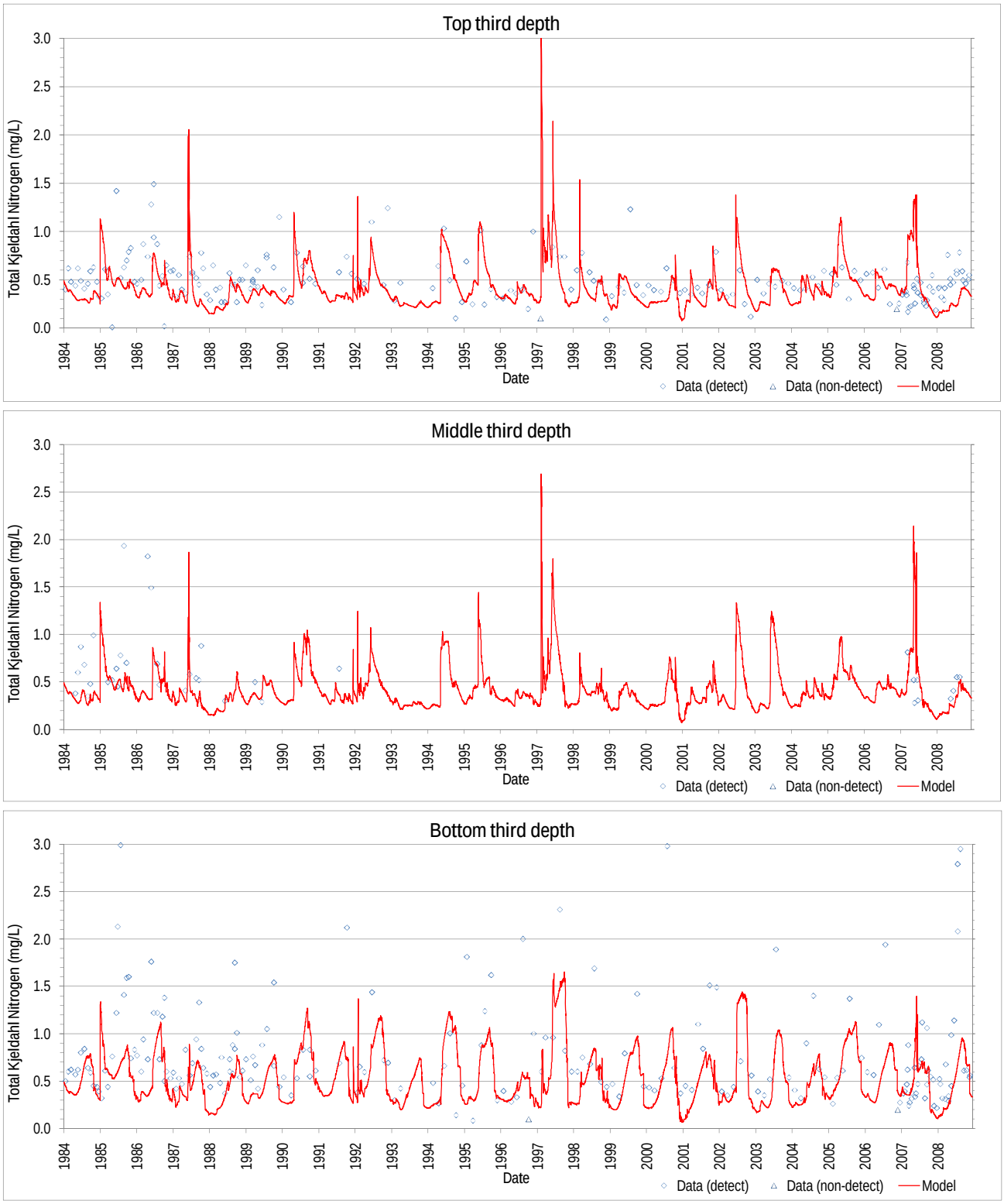


Figure 4-80 Temporal of Model versus Data for LBJ near Alvin Wirtz Dam (Segment 54) - Total Kjeldahl Nitrogen

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

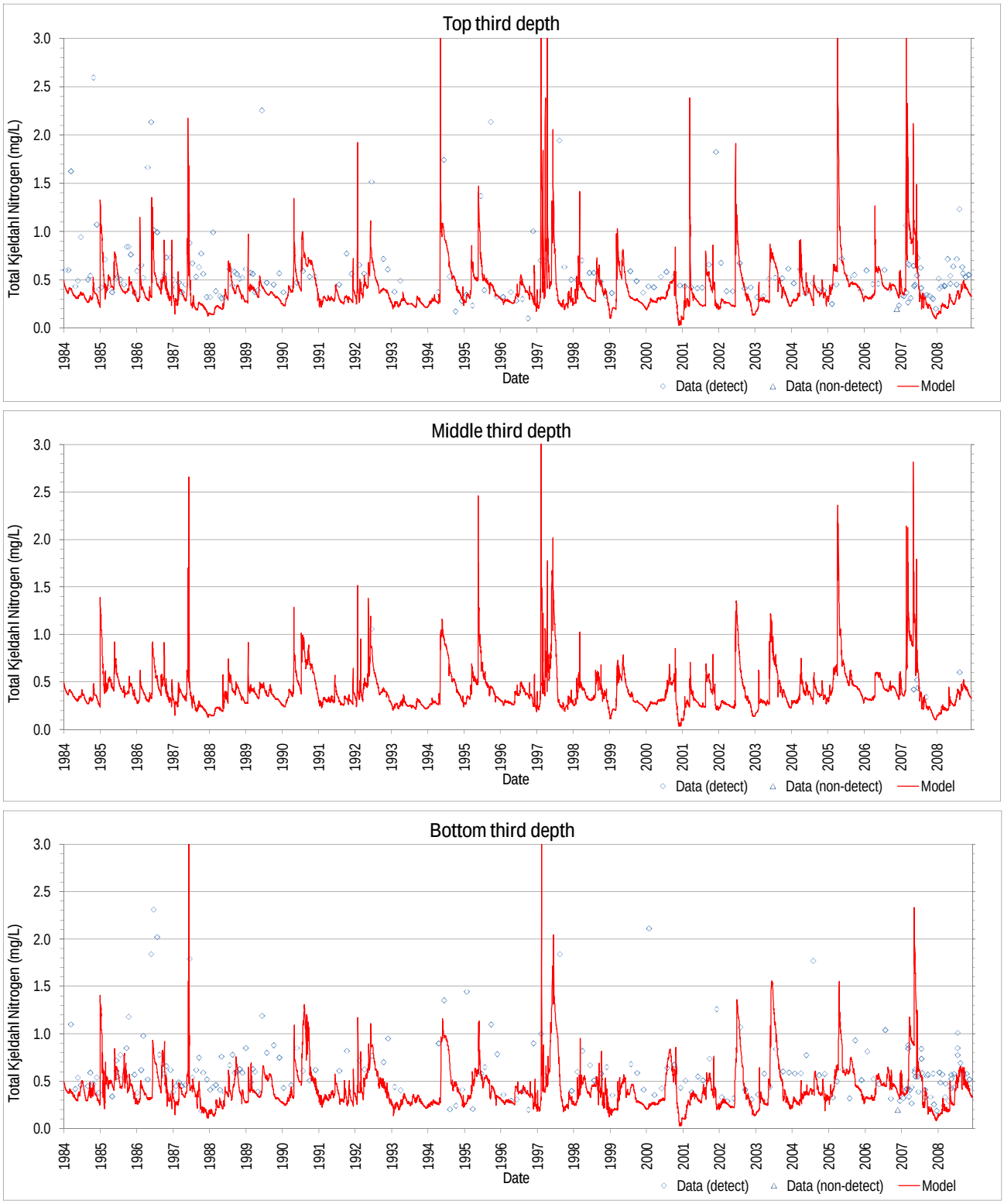


Figure 4-81 Temporal of Model versus Data for LBJ at Confluence with Sandy Creek Arm (Segment 41) - Total Kjeldahl Nitrogen

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

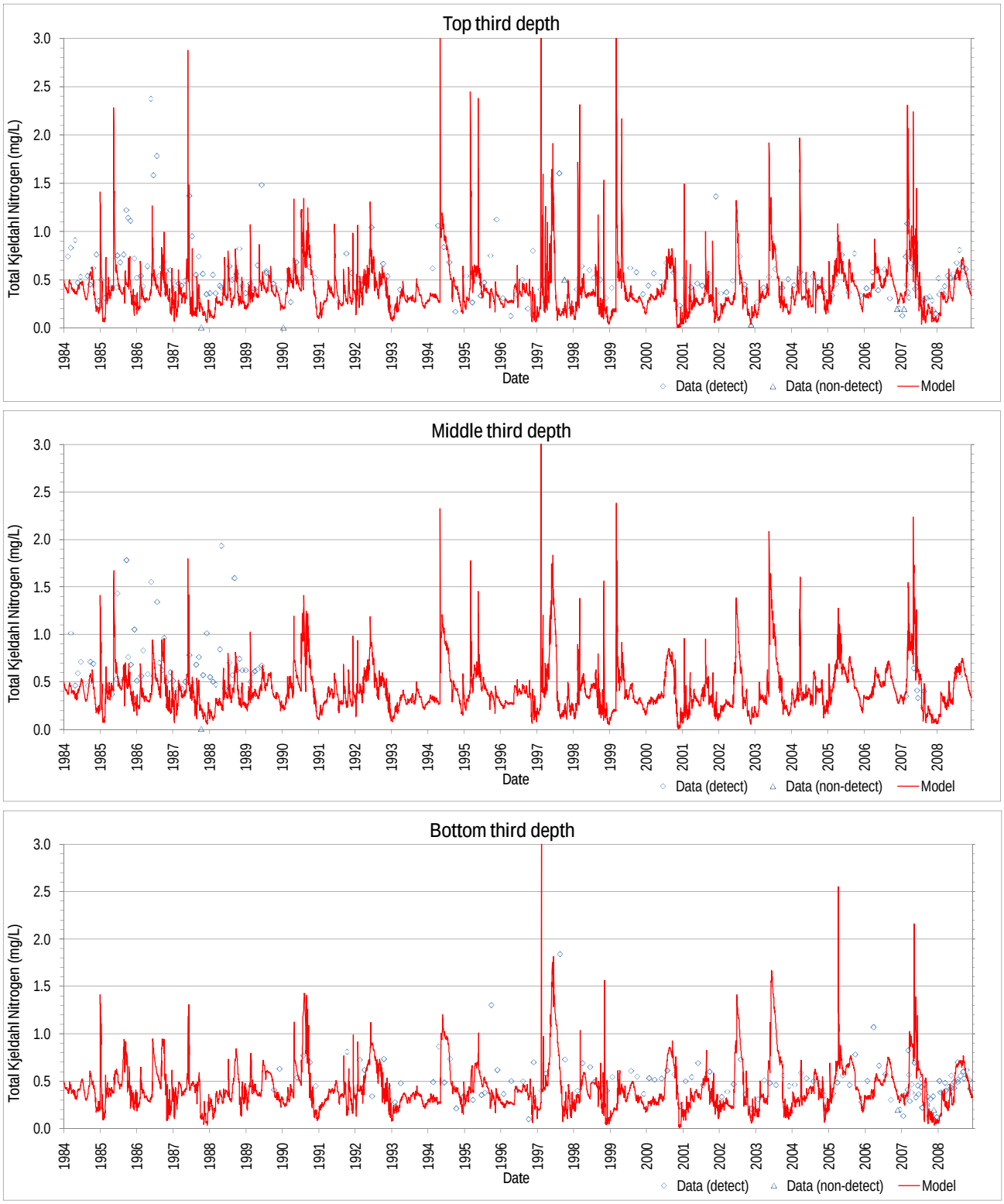


Figure 4-82 Temporal of Model versus Data for LBJ at Confluence with Llano River Arm (Segment 30) - Total Kjeldahl Nitrogen

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

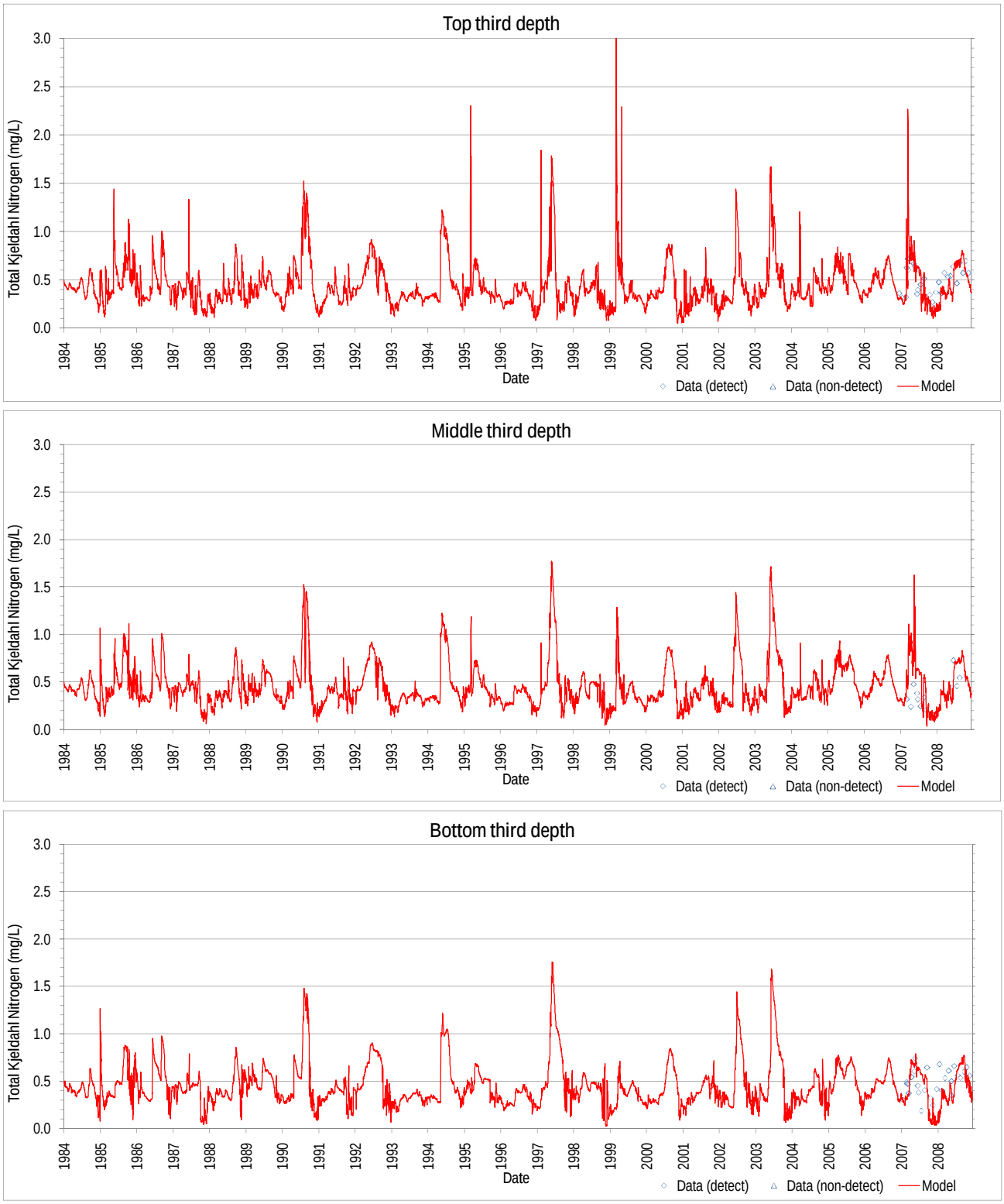


Figure 4-83 Temporal of Model versus Data for LBJ at Kingsland Cove (Segment 24) - Total Kjeldahl Nitrogen

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

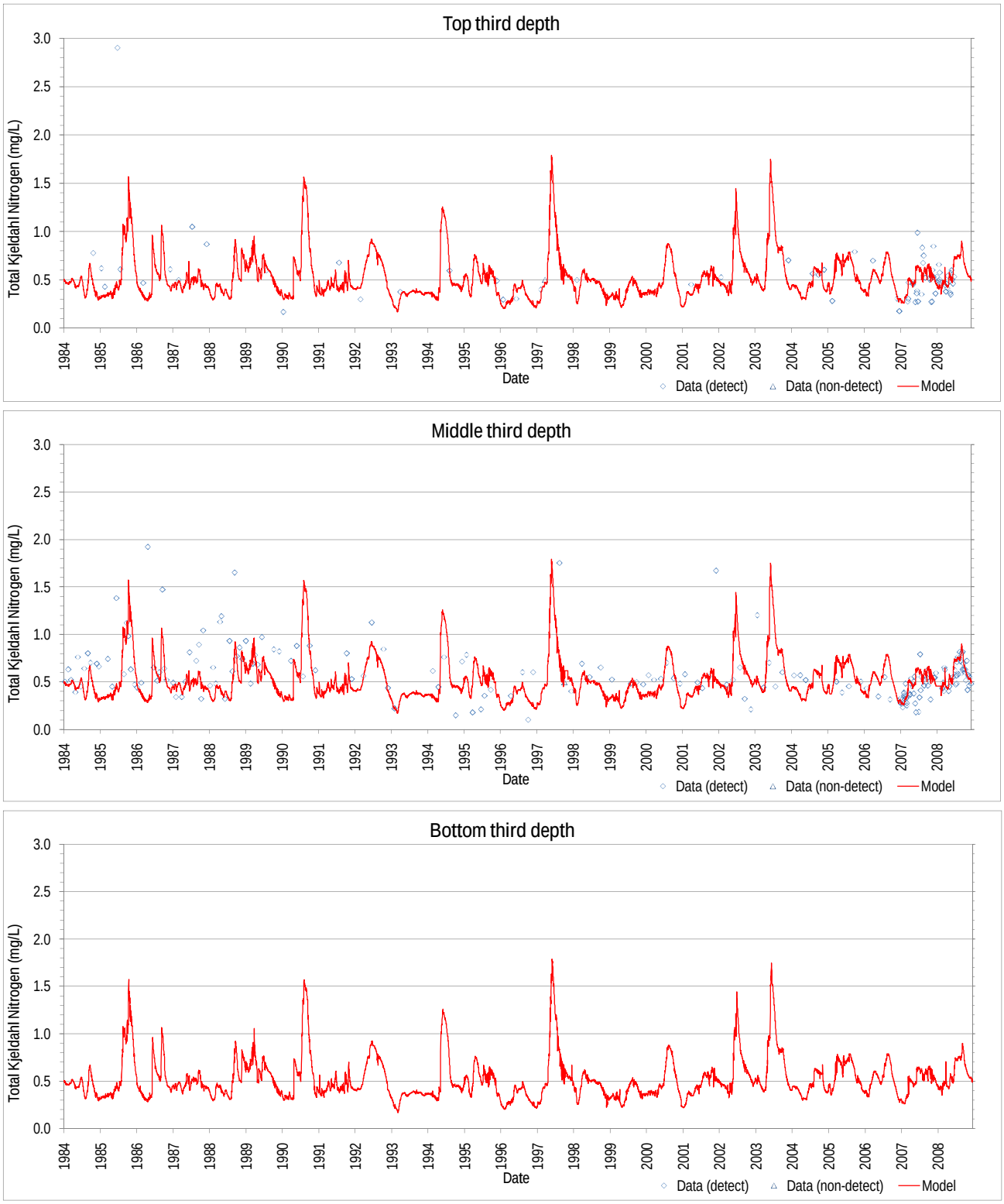


Figure 4-84 Temporal of Model versus Data for LBJ at Headwaters (Segment 2) - Total Kjeldahl Nitrogen

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

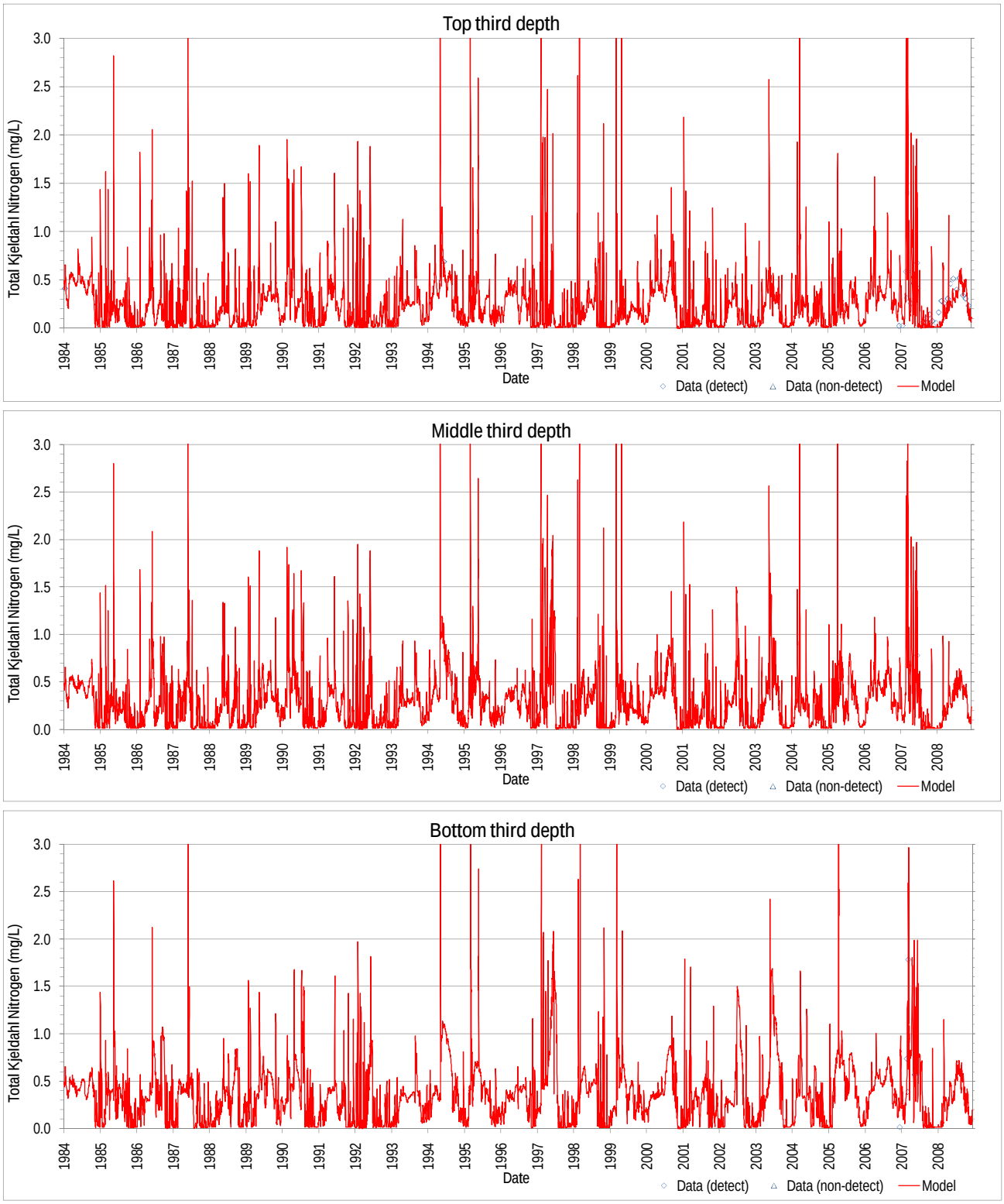


Figure 4-85 Temporal of Model versus Data for LBJ at FM 2900 (Segment 62) - Total Kjeldahl Nitrogen

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

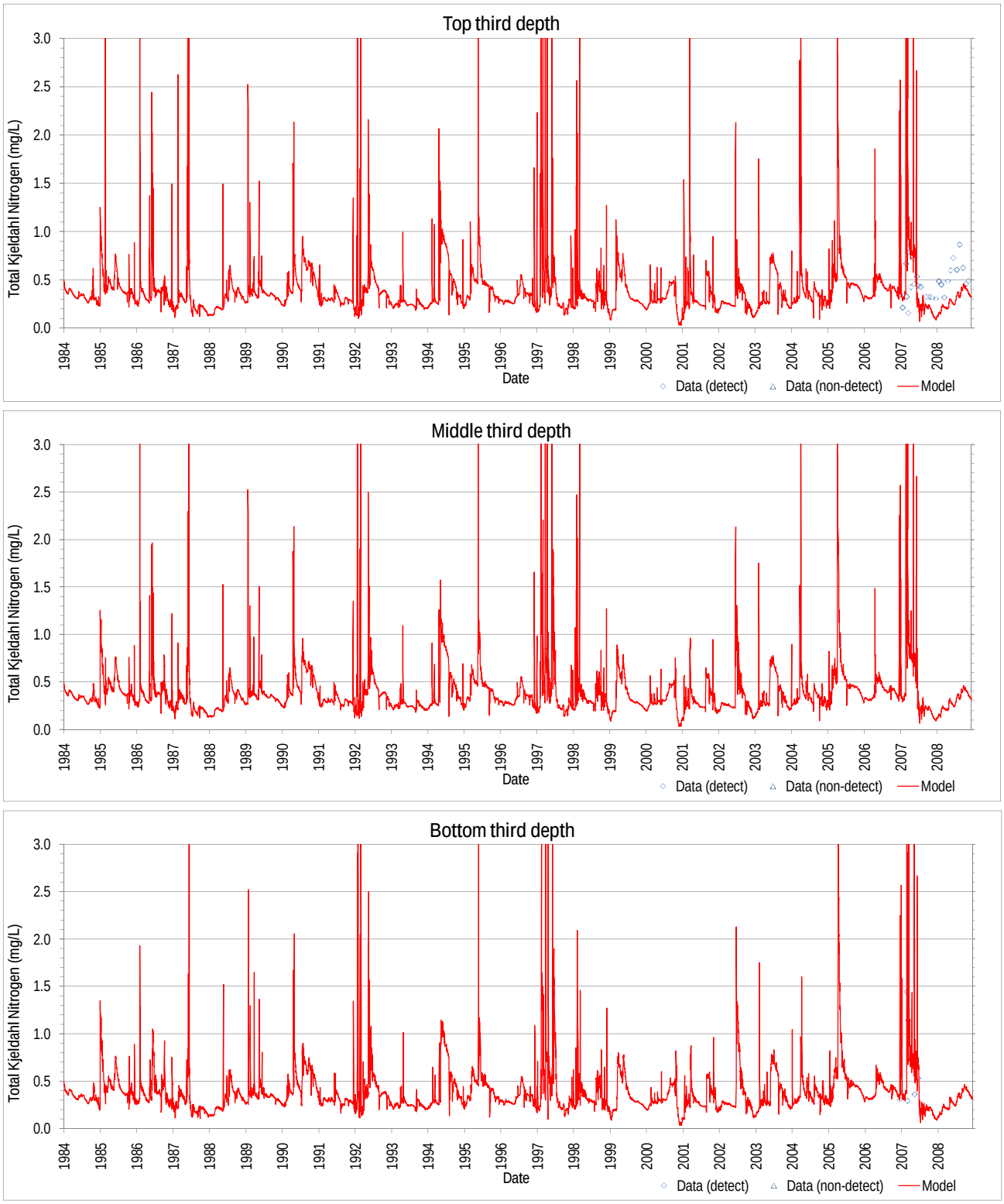


Figure 4-86 Temporal of Model versus Data for LBJ near Lake Shore Drive (Segment 78) - Total Kjeldahl Nitrogen

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

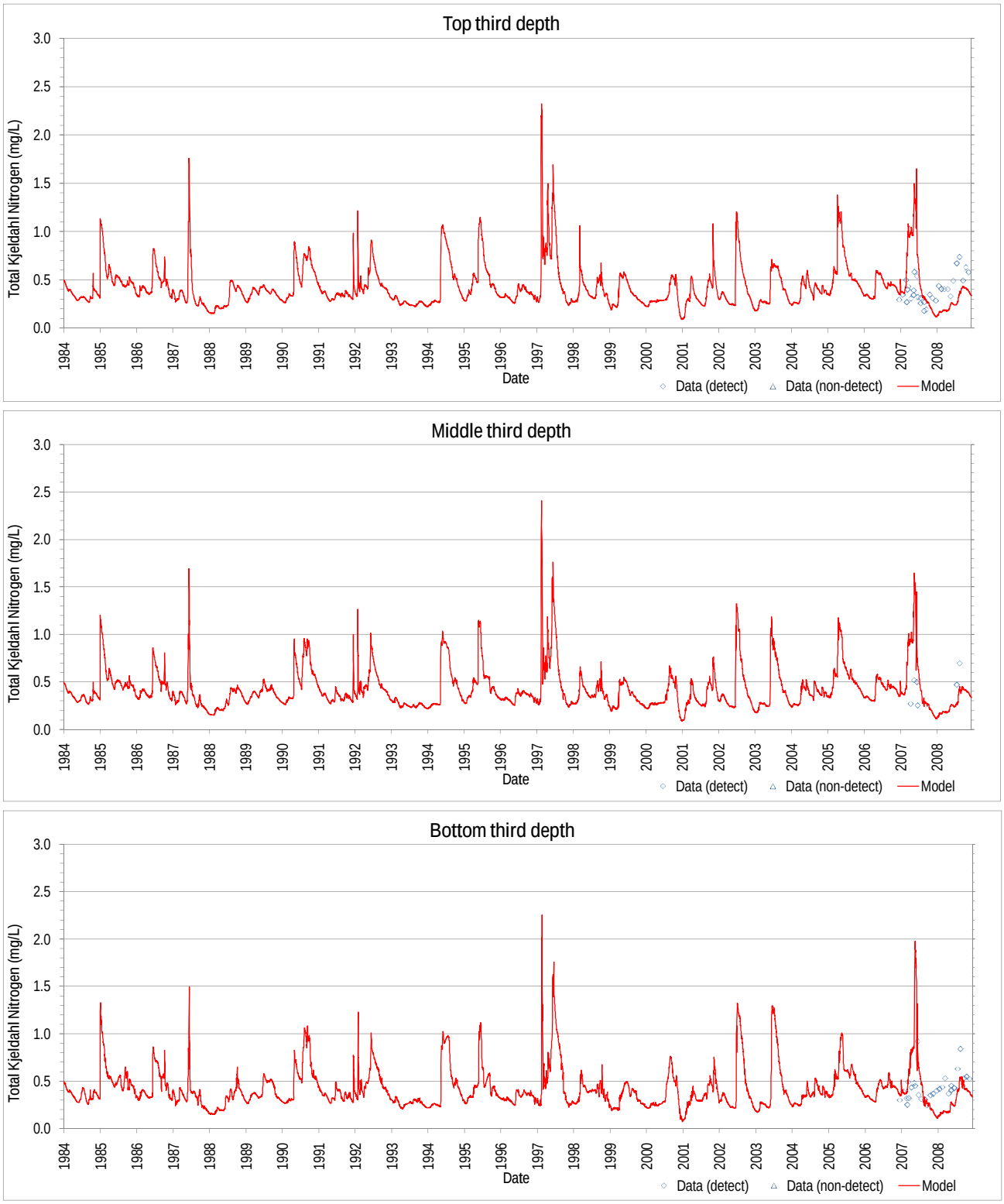


Figure 4-87 Temporal of Model versus Data for LBJ at Horseshoe Bay Cove (Segment 100) - Total Kjeldahl Nitrogen

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

Figure 4-88 Temporal of Model versus Data for LBJ near Alvin Wirtz Dam (Segment 54) - Ammonium Nitrogen

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

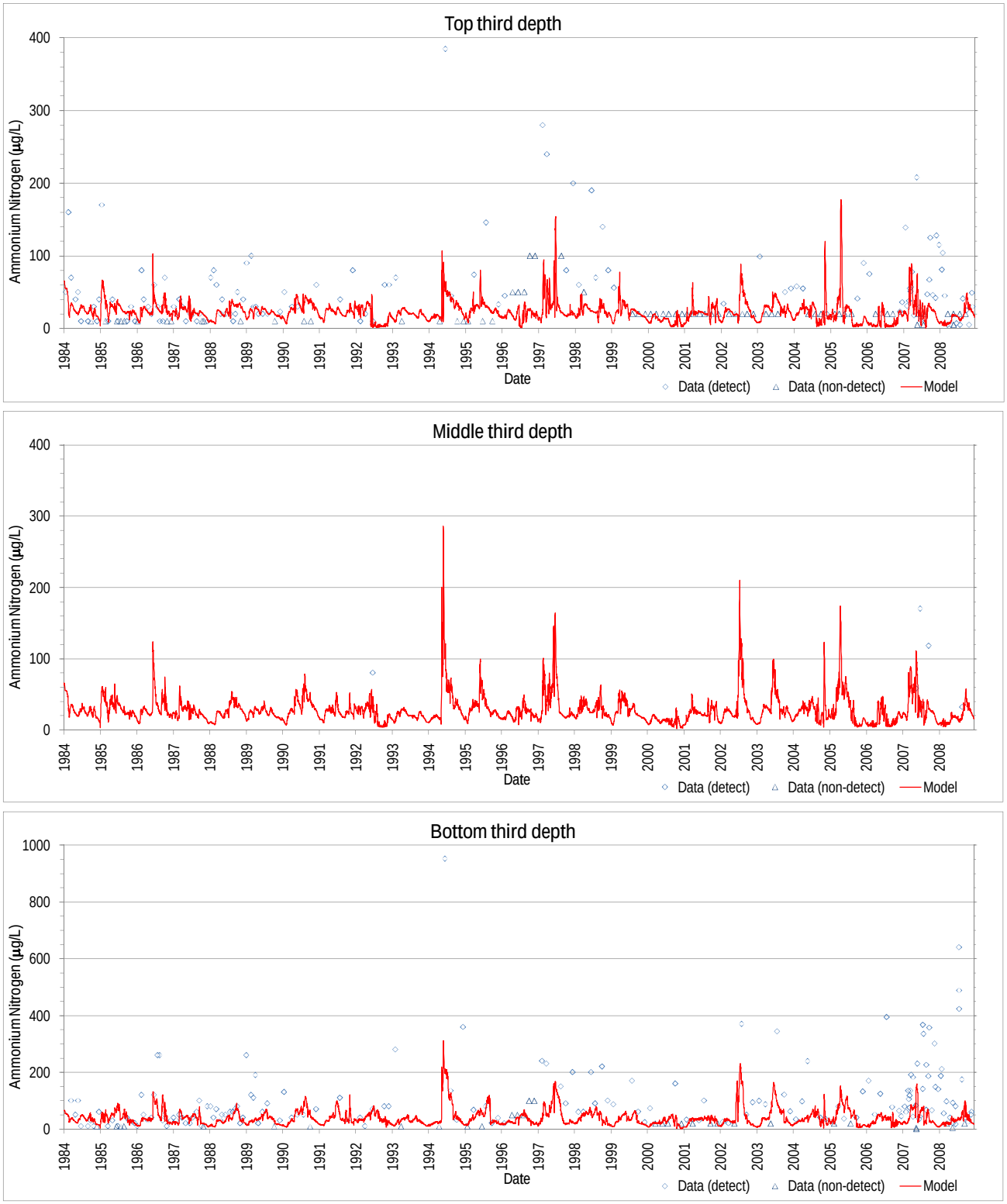


Figure 4-89 Temporal of Model versus Data for LBJ at Confluence with Sandy Creek Arm (Segment 41) - Ammonium Nitrogen

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

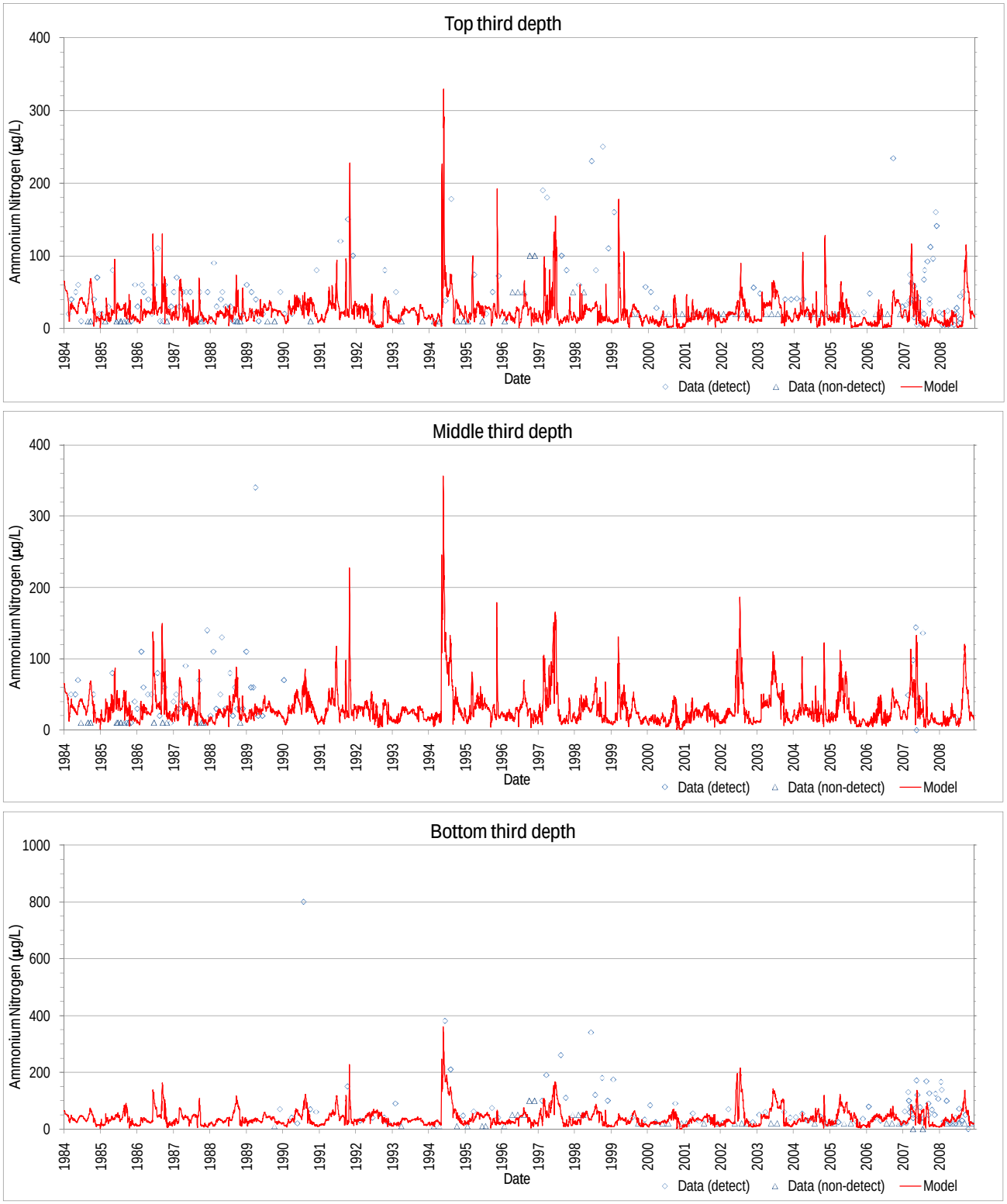


Figure 4-90 Temporal of Model versus Data for LBJ at Confluence with Llano River Arm (Segment 30) - Ammonium Nitrogen

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

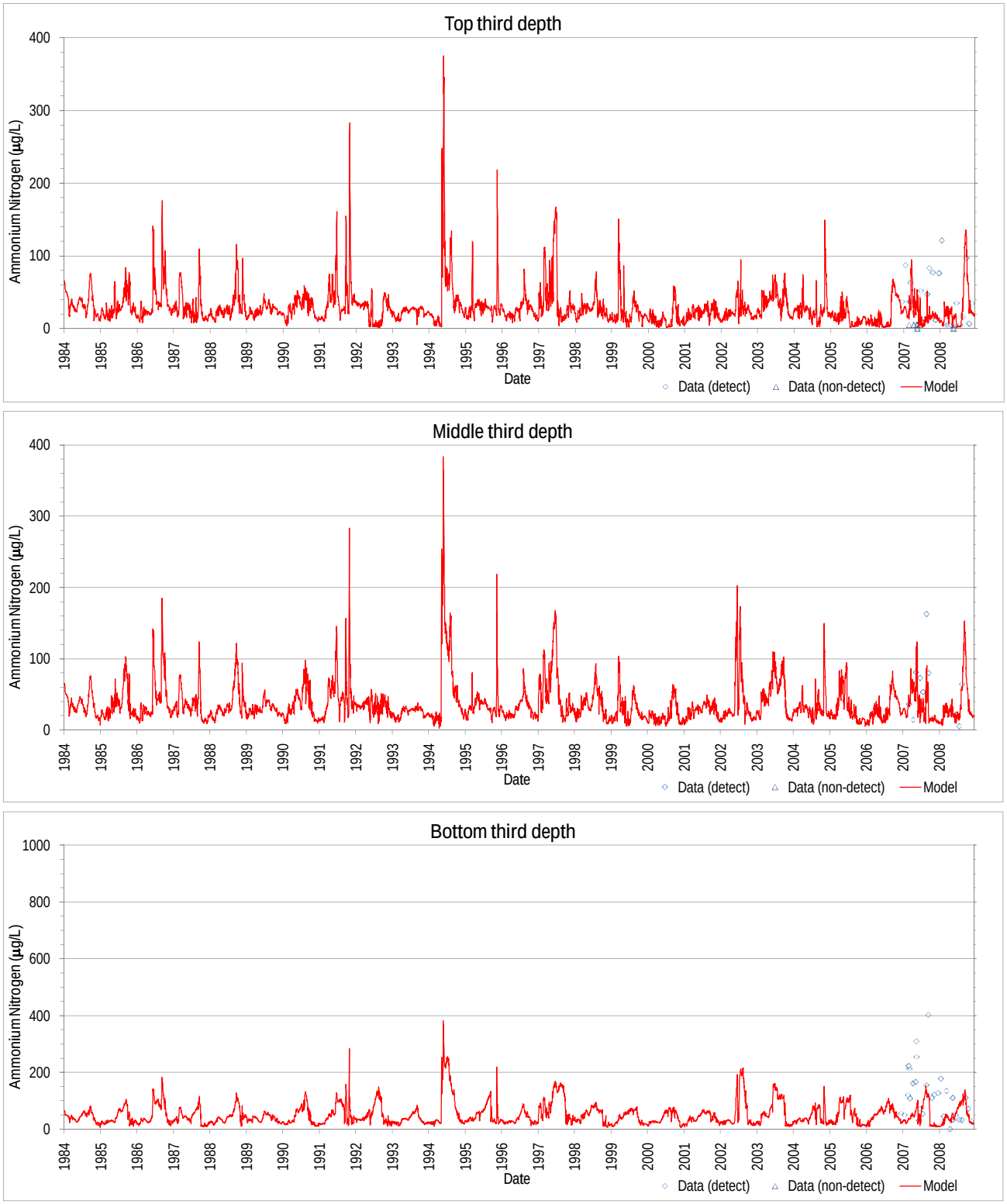


Figure 4-91 Temporal of Model versus Data for LBJ at Kingsland Cove (Segment 24) - Ammonium Nitrogen

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

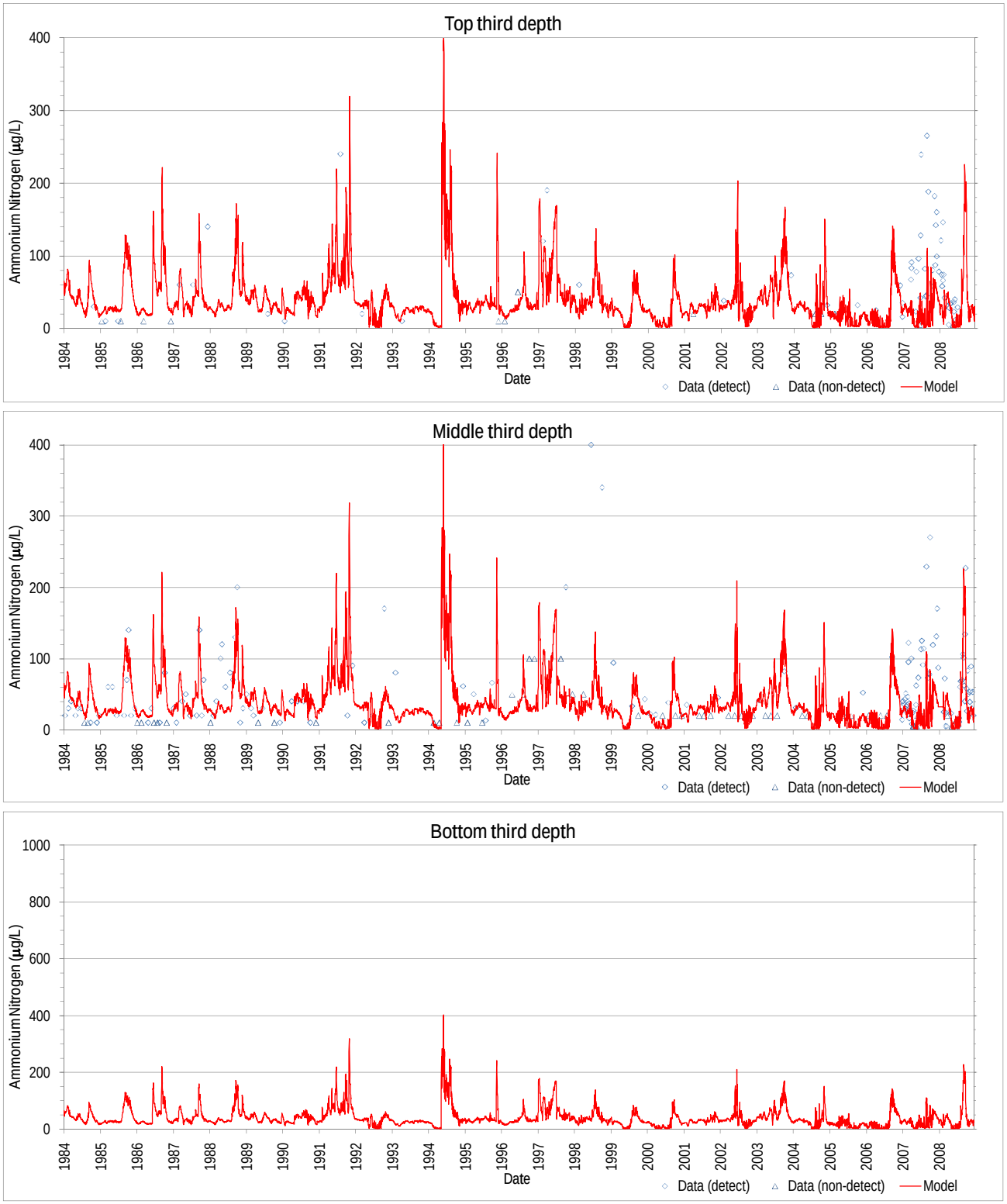


Figure 4-92 Temporal of Model versus Data for LBJ at Headwaters (Segment 2) - Ammonium Nitrogen

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

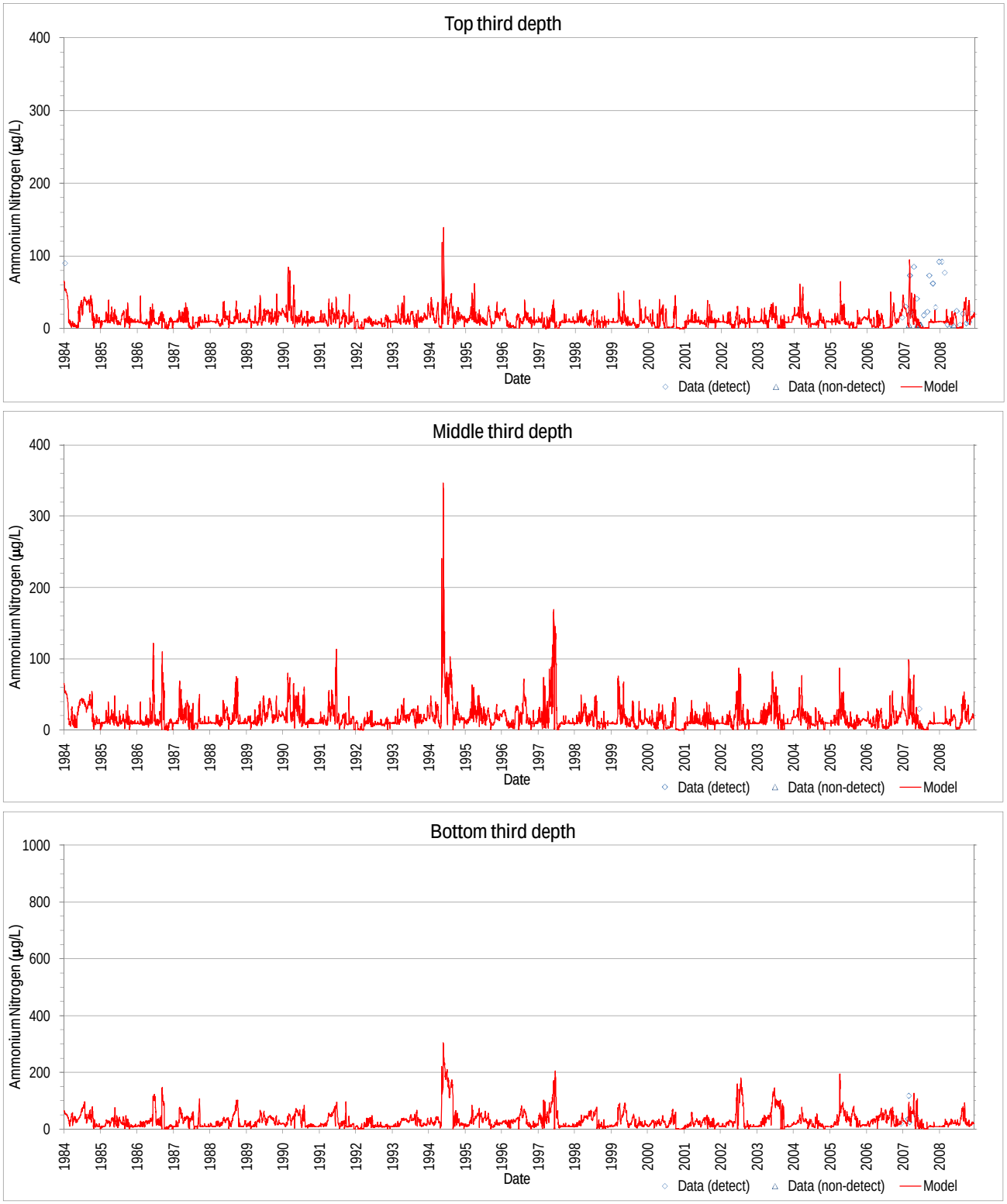


Figure 4-93 Temporal of Model versus Data for LBJ at FM 2900 (Segment 62) - Ammonium Nitrogen

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

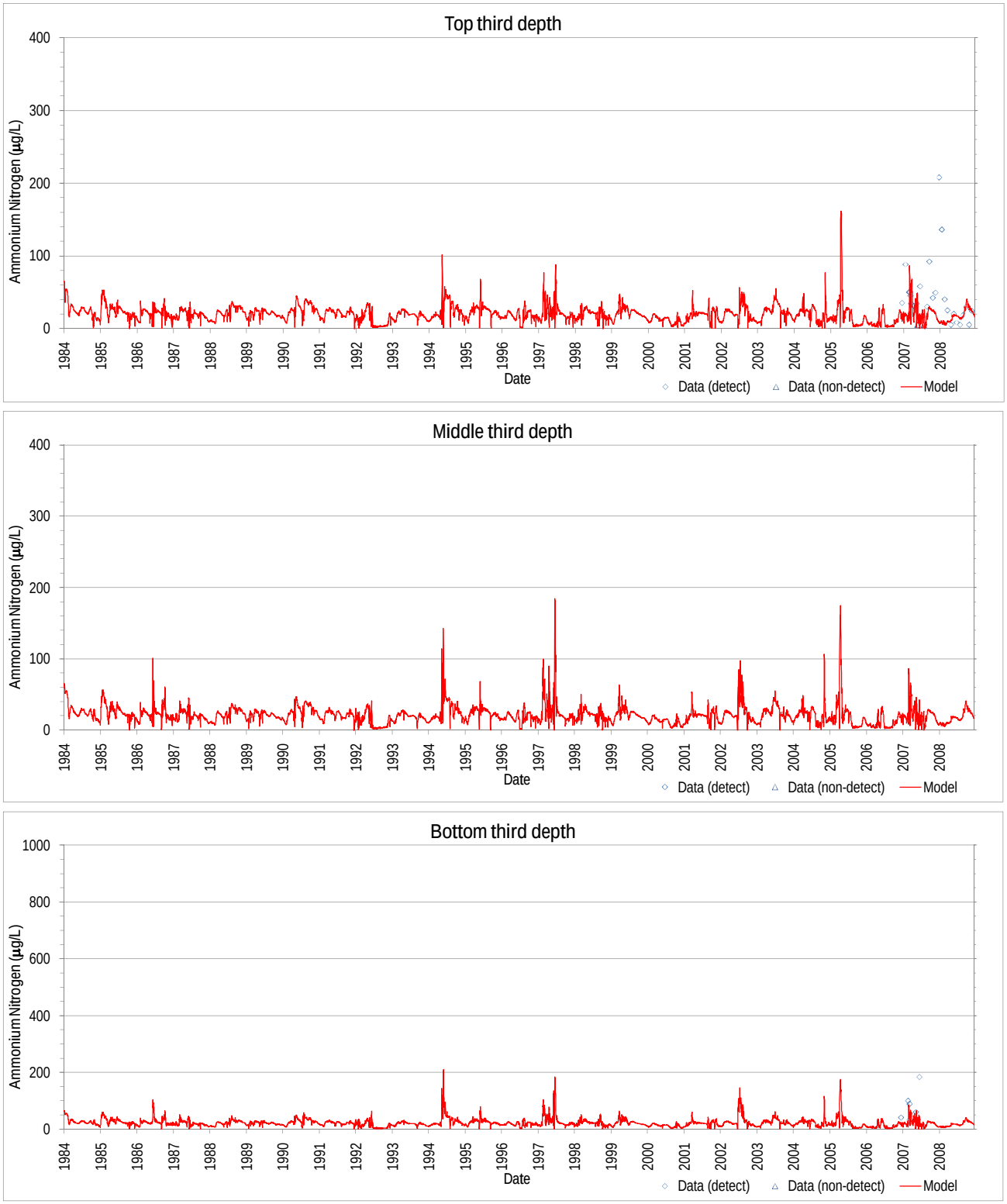


Figure 4-94 Temporal of Model versus Data for LBJ near Lake Shore Drive (Segment 78) - Ammonium Nitrogen

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

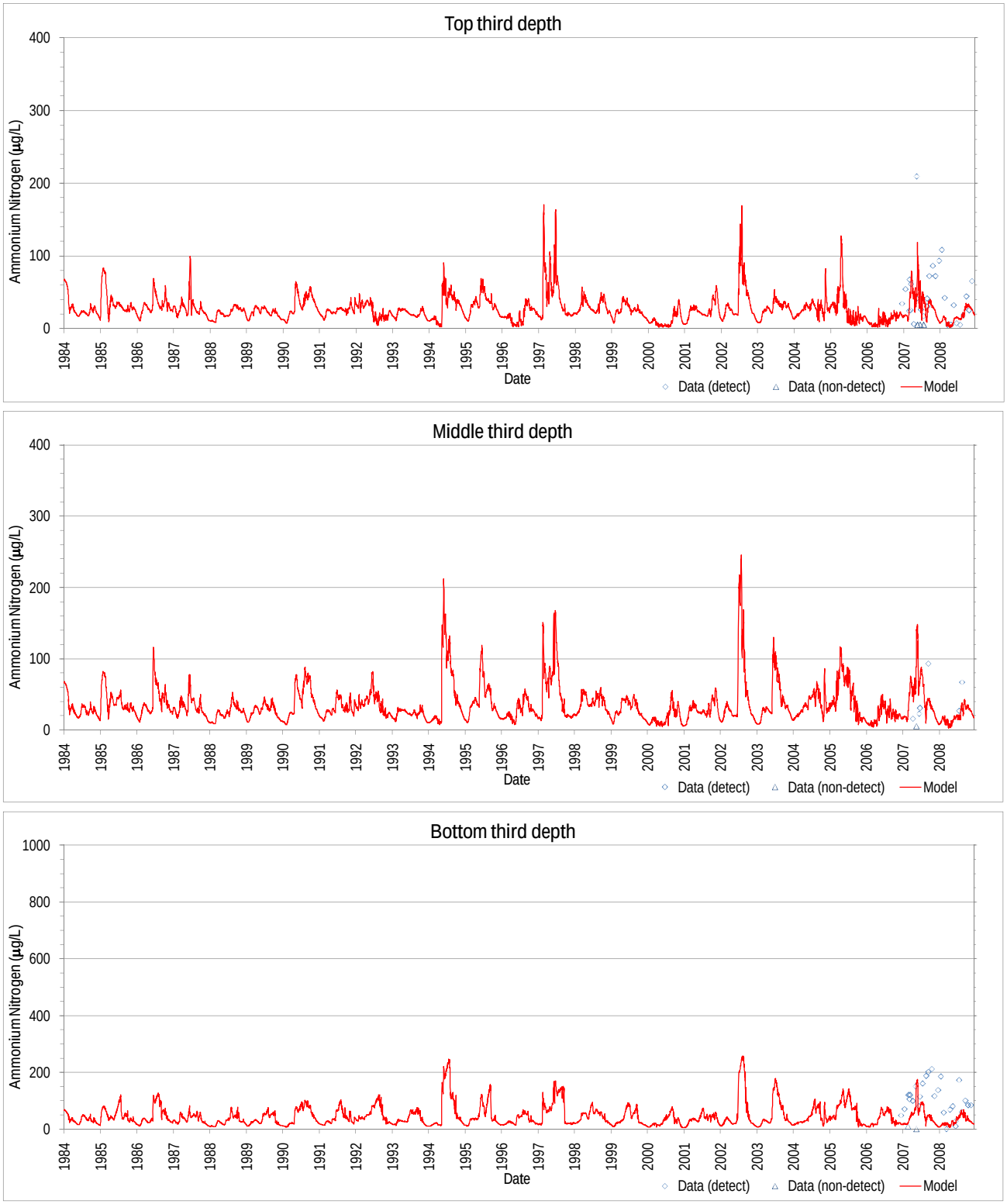


Figure 4-95 Temporal of Model versus Data for LBJ at Horseshoe Bay Cove (Segment 100) - Ammonium Nitrogen

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

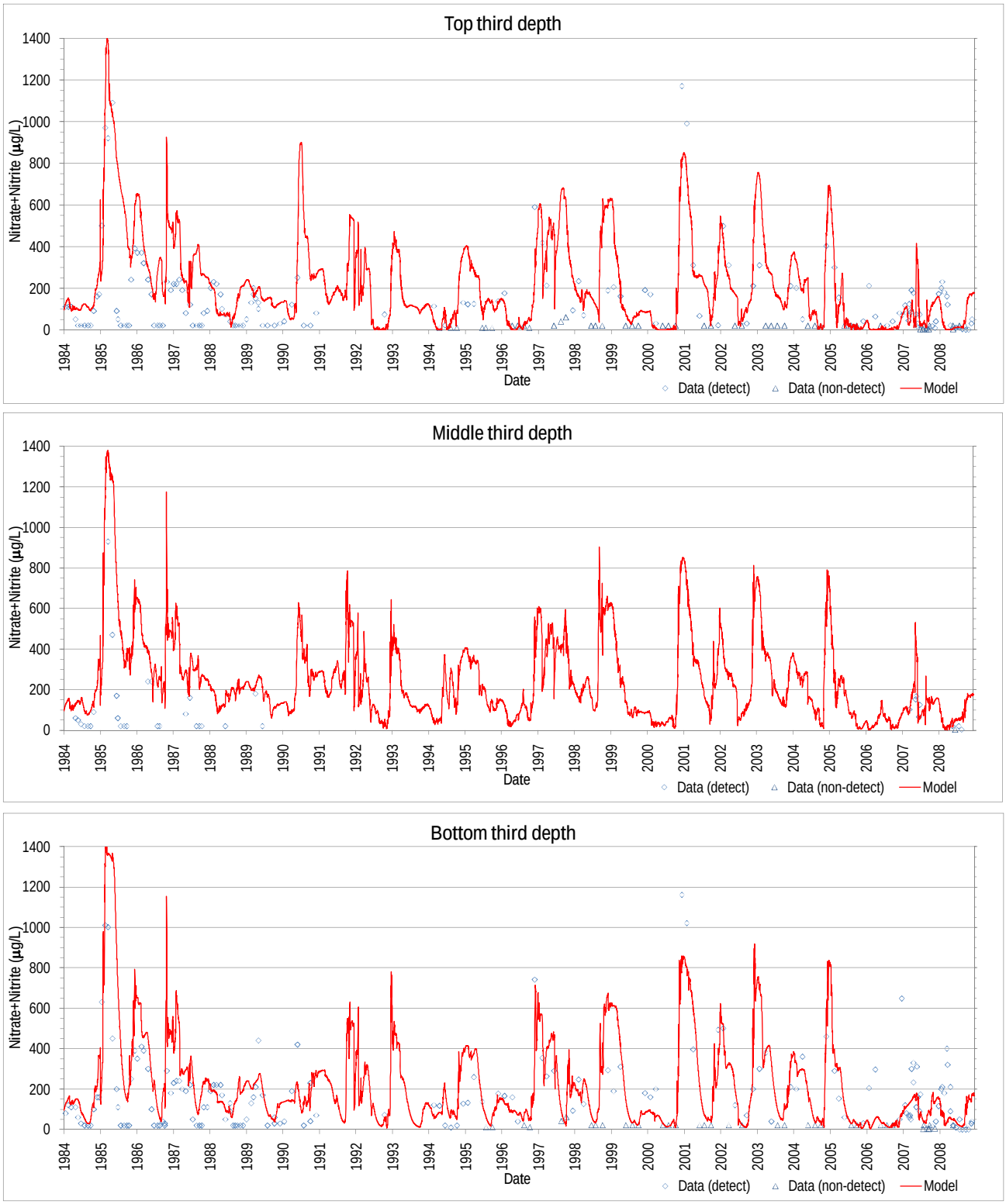


Figure 4-96 Temporal of Model versus Data for LBJ near Alvin Wirtz Dam (Segment 54) - Nitrate+Nitrite

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

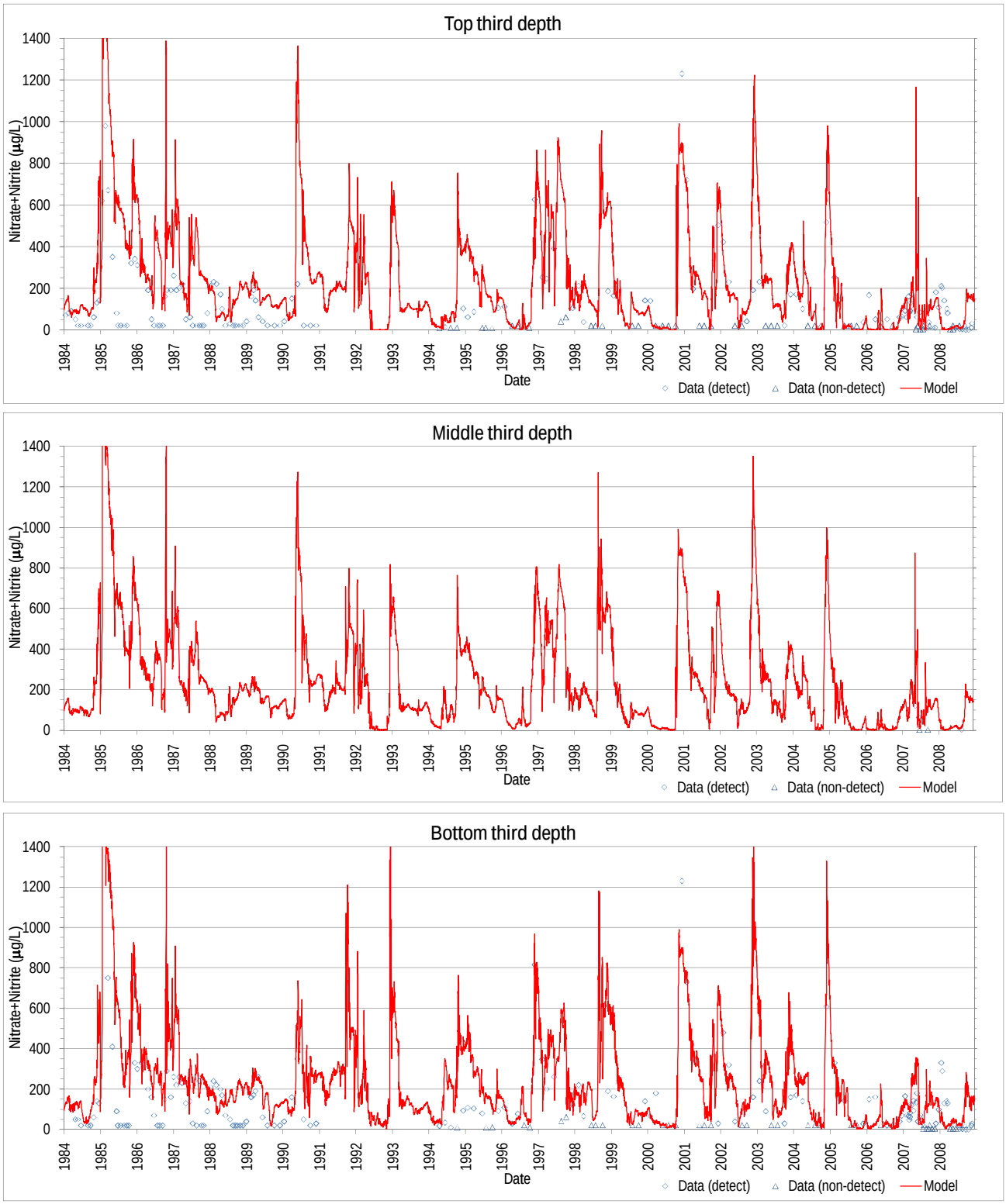


Figure 4-97 Temporal of Model versus Data for LBJ at Confluence with Sandy Creek Arm (Segment 41) - Nitrate+Nitrite

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

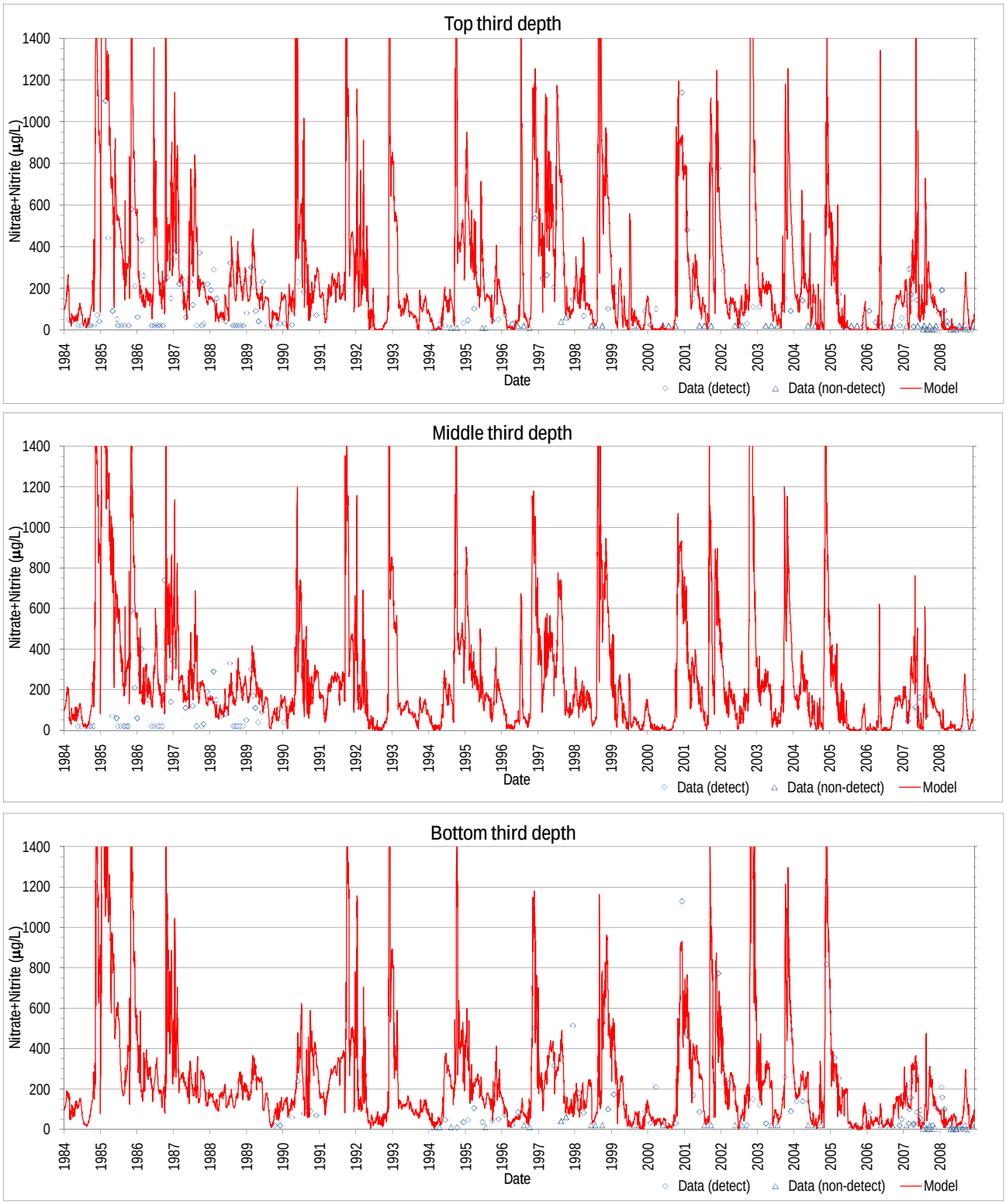


Figure 4-98 Temporal of Model versus Data for LBJ at Confluence with Llano River Arm (Segment 30) - Nitrate+Nitrite

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

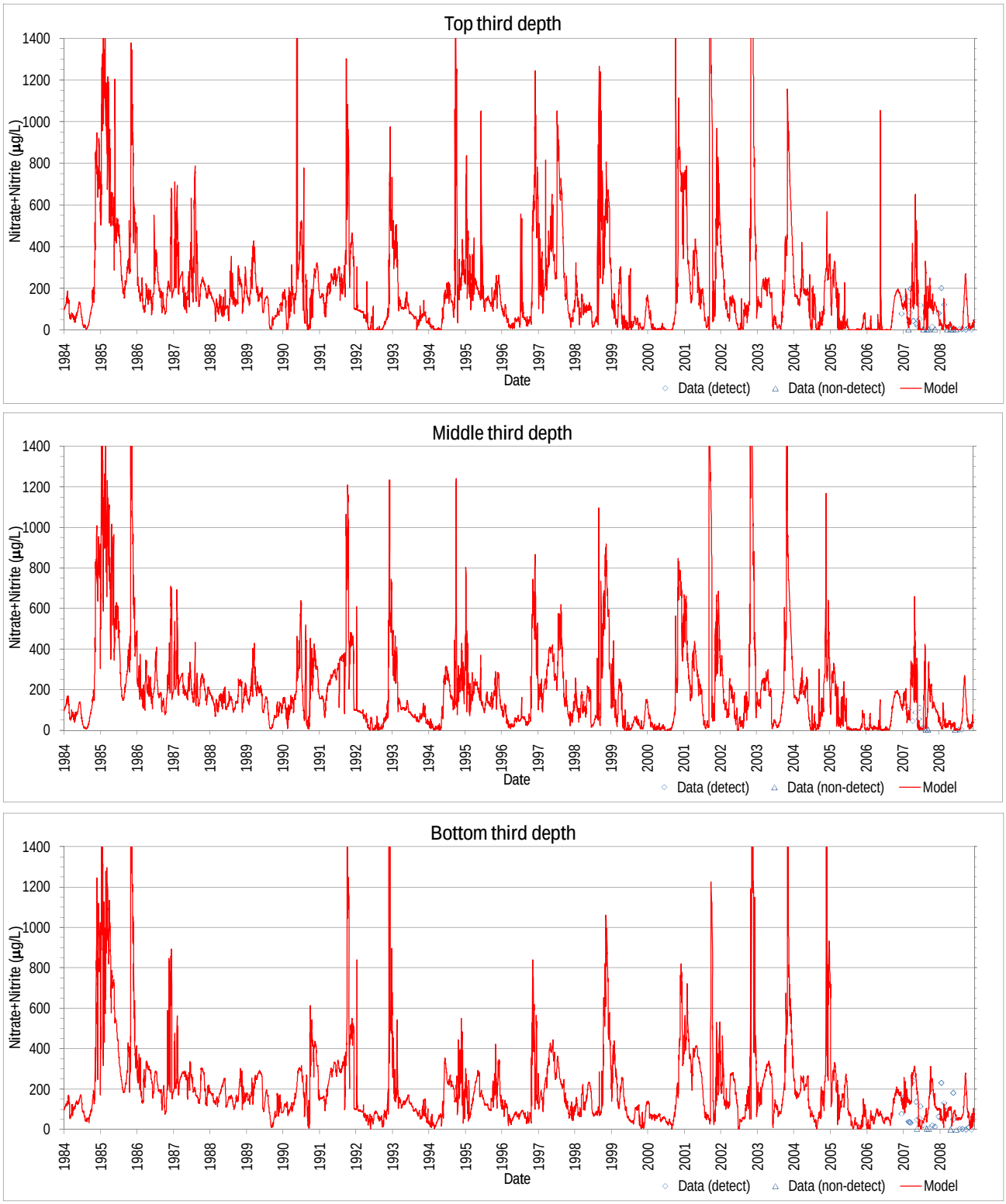


Figure 4-99 Temporal of Model versus Data for LBJ at Kingsland Cove (Segment 24) - Nitrate+Nitrite

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

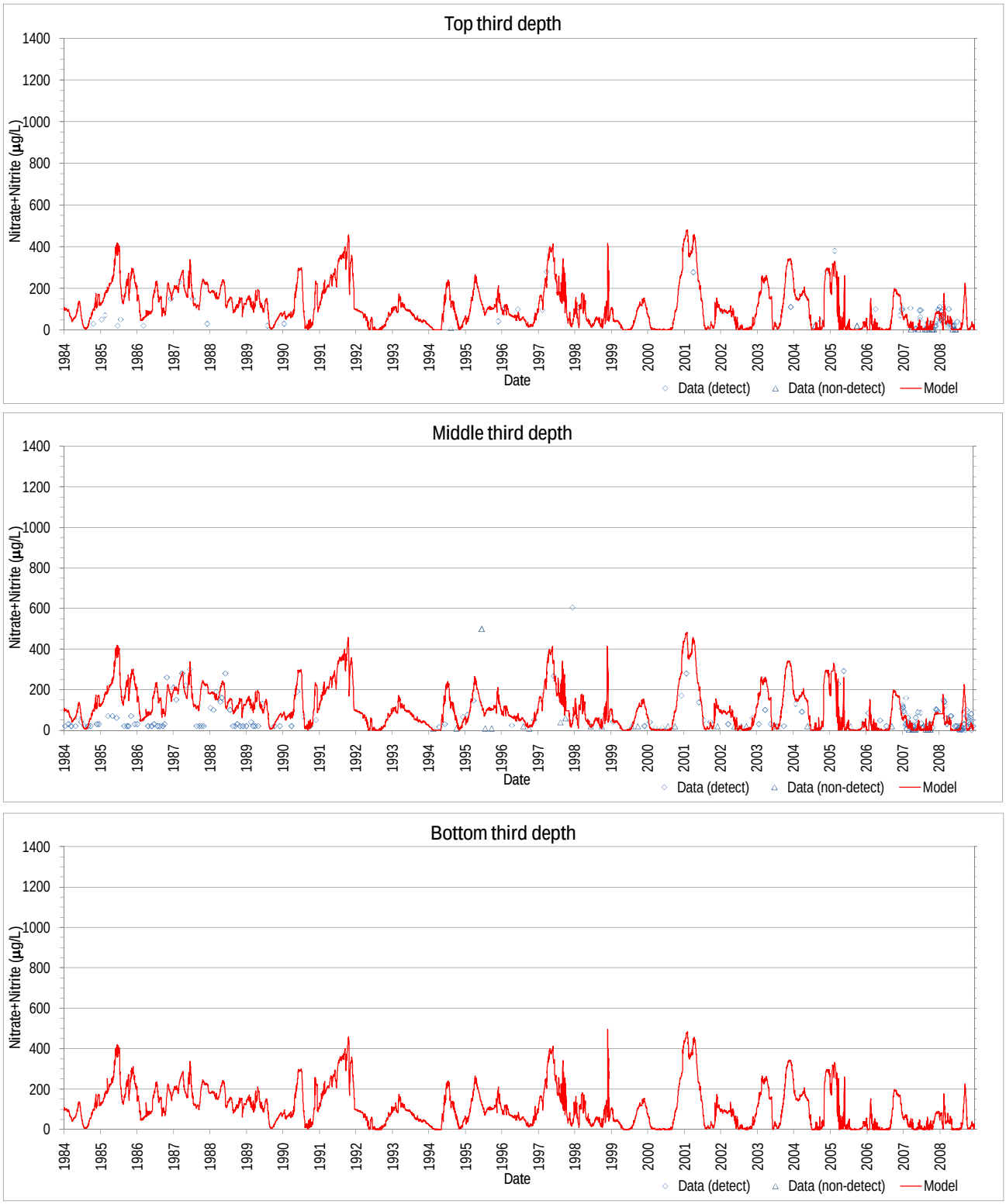


Figure 4-100 Temporal of Model versus Data for LBJ at Headwaters (Segment 2) - Nitrate+Nitrite

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

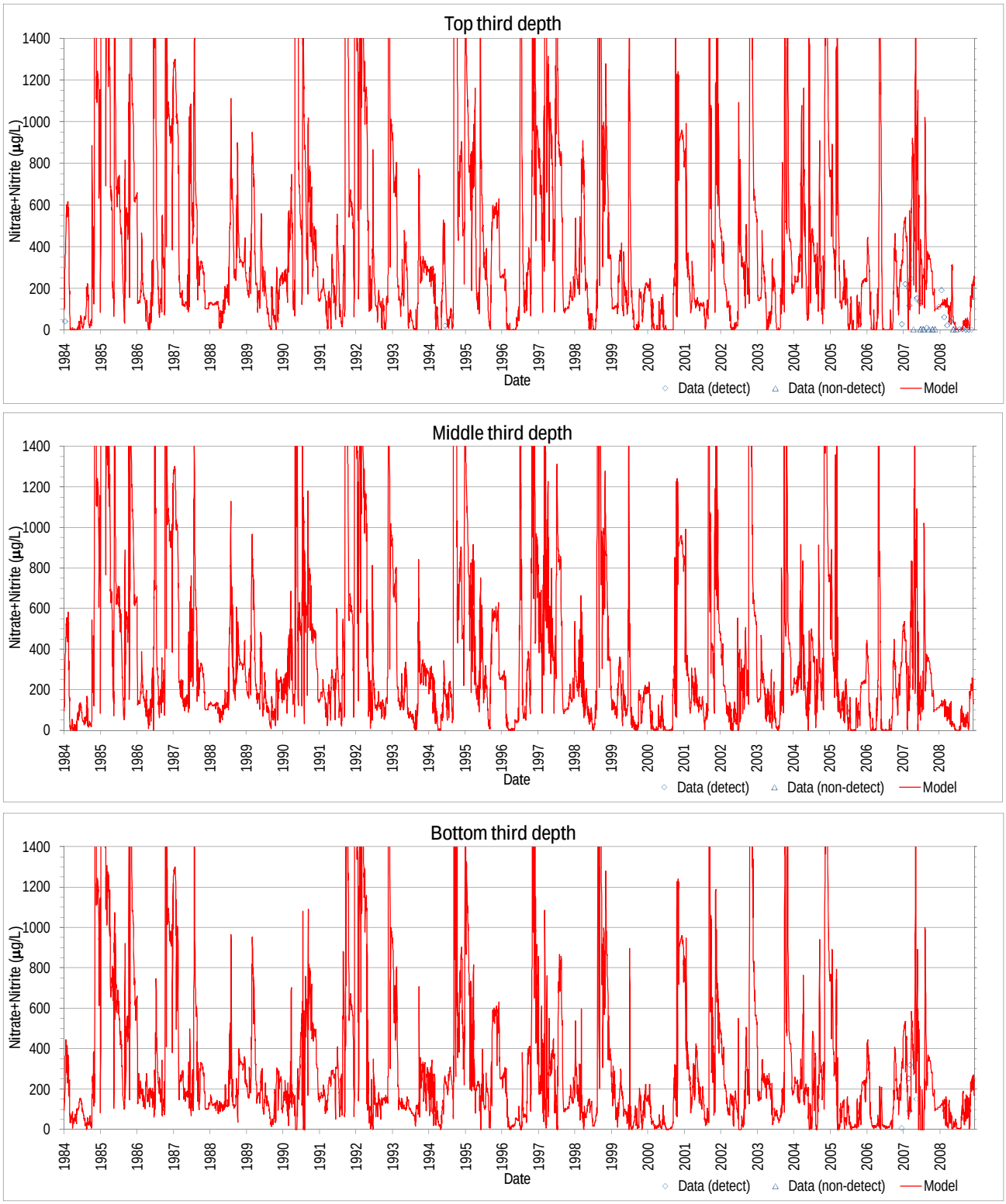


Figure 4-101 Temporal of Model versus Data for LBJ at FM 2900 (Segment 62) - Nitrate+Nitrite

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

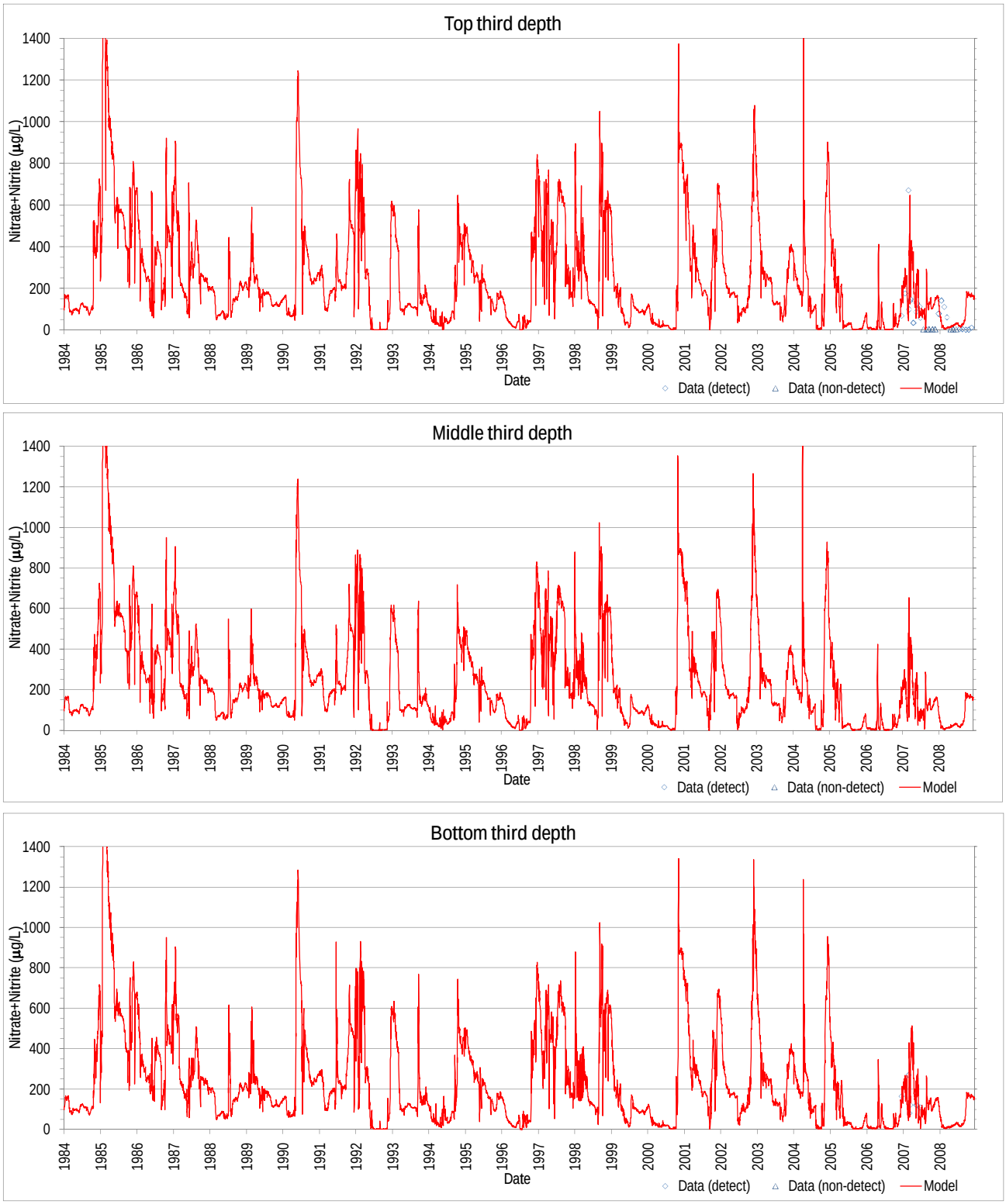


Figure 4-102 Temporal of Model versus Data for LBJ near Lake Shore Drive (Segment 78) - Nitrate+Nitrite

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

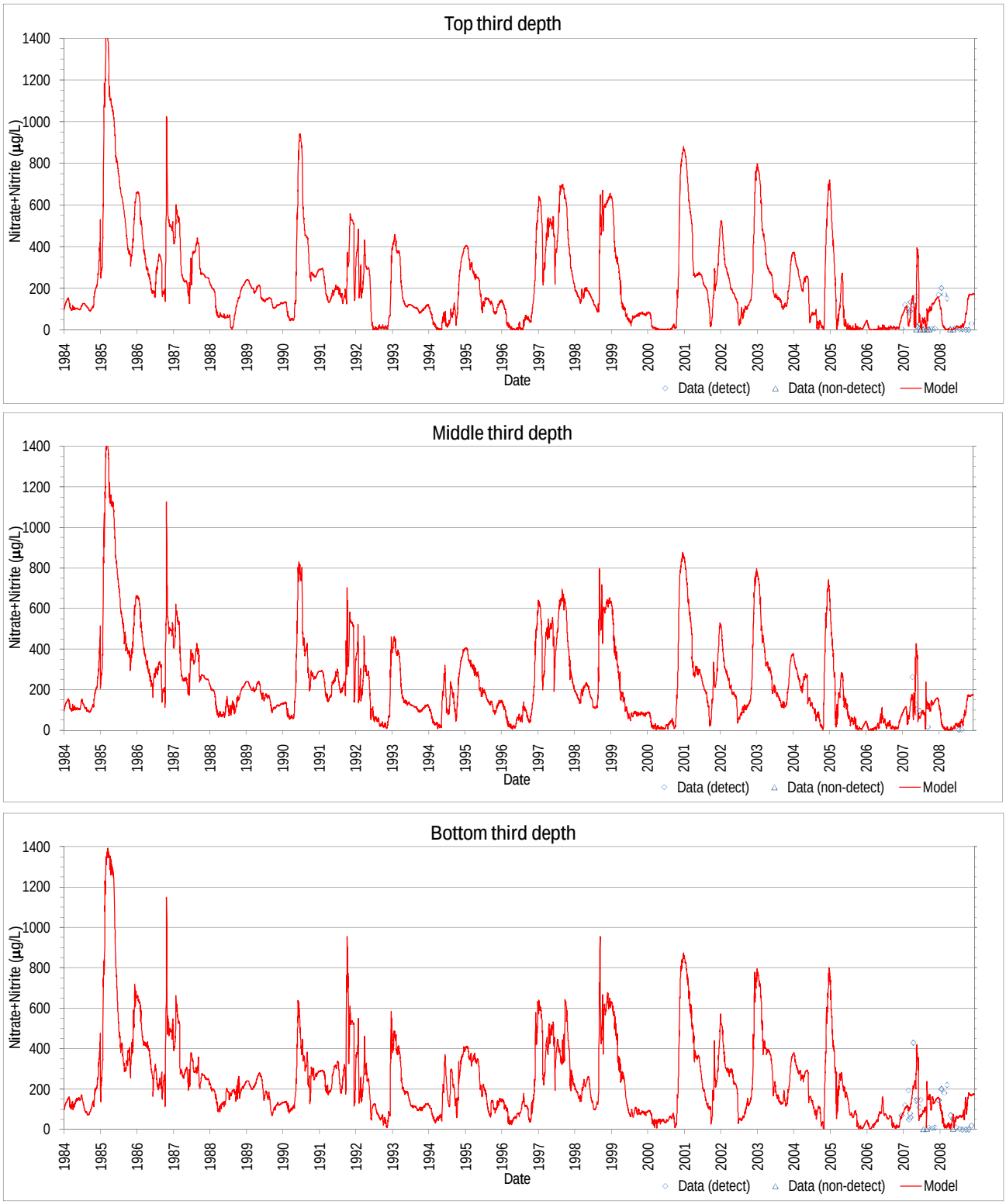


Figure 4-103 Temporal of Model versus Data for LBJ at Horseshoe Bay Cove (Segment 100) - Nitrate+Nitrite

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

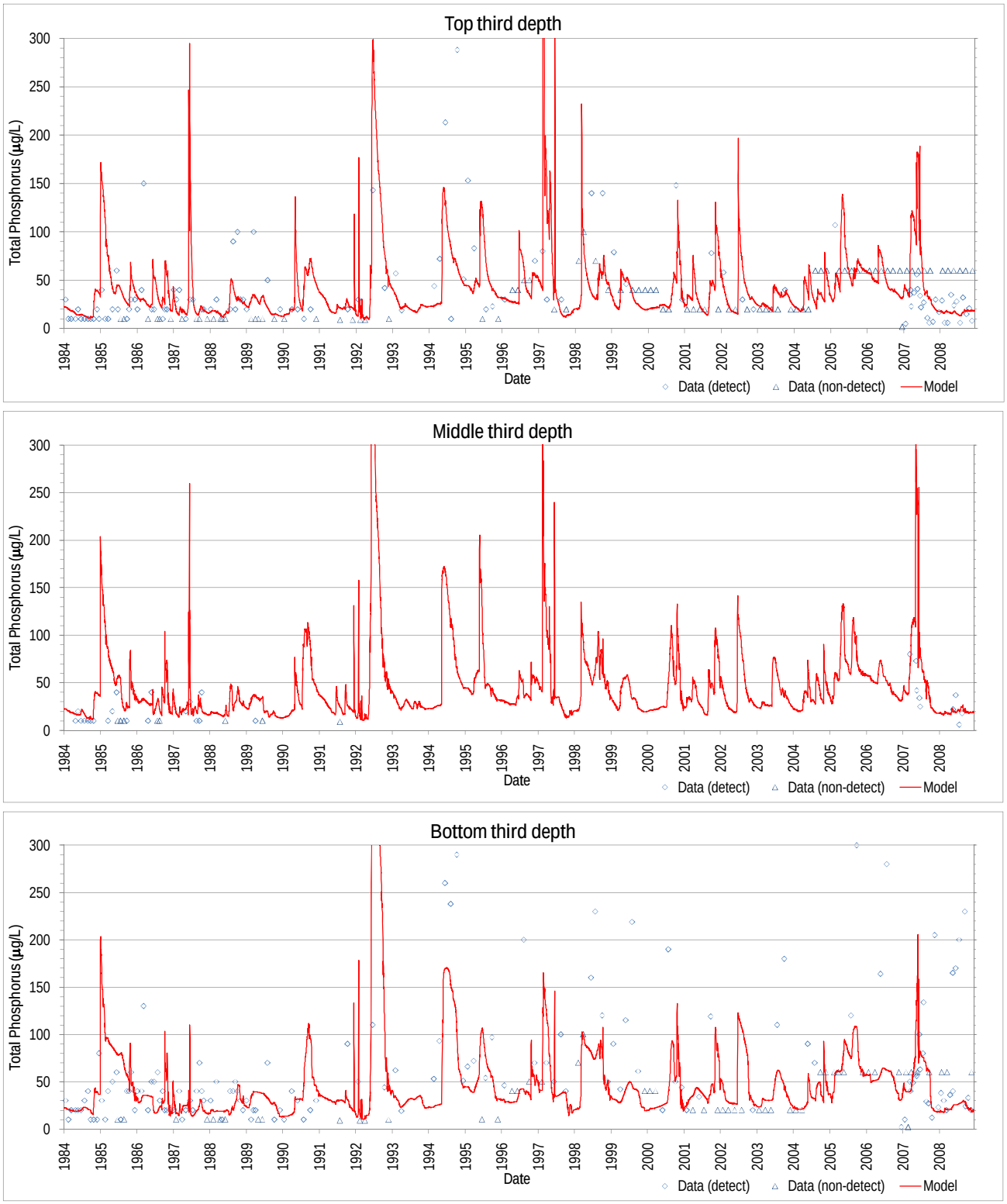


Figure 4-104 Temporal of Model versus Data for LBJ near Alvin Wirtz Dam (Segment 54) - Total Phosphorus

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

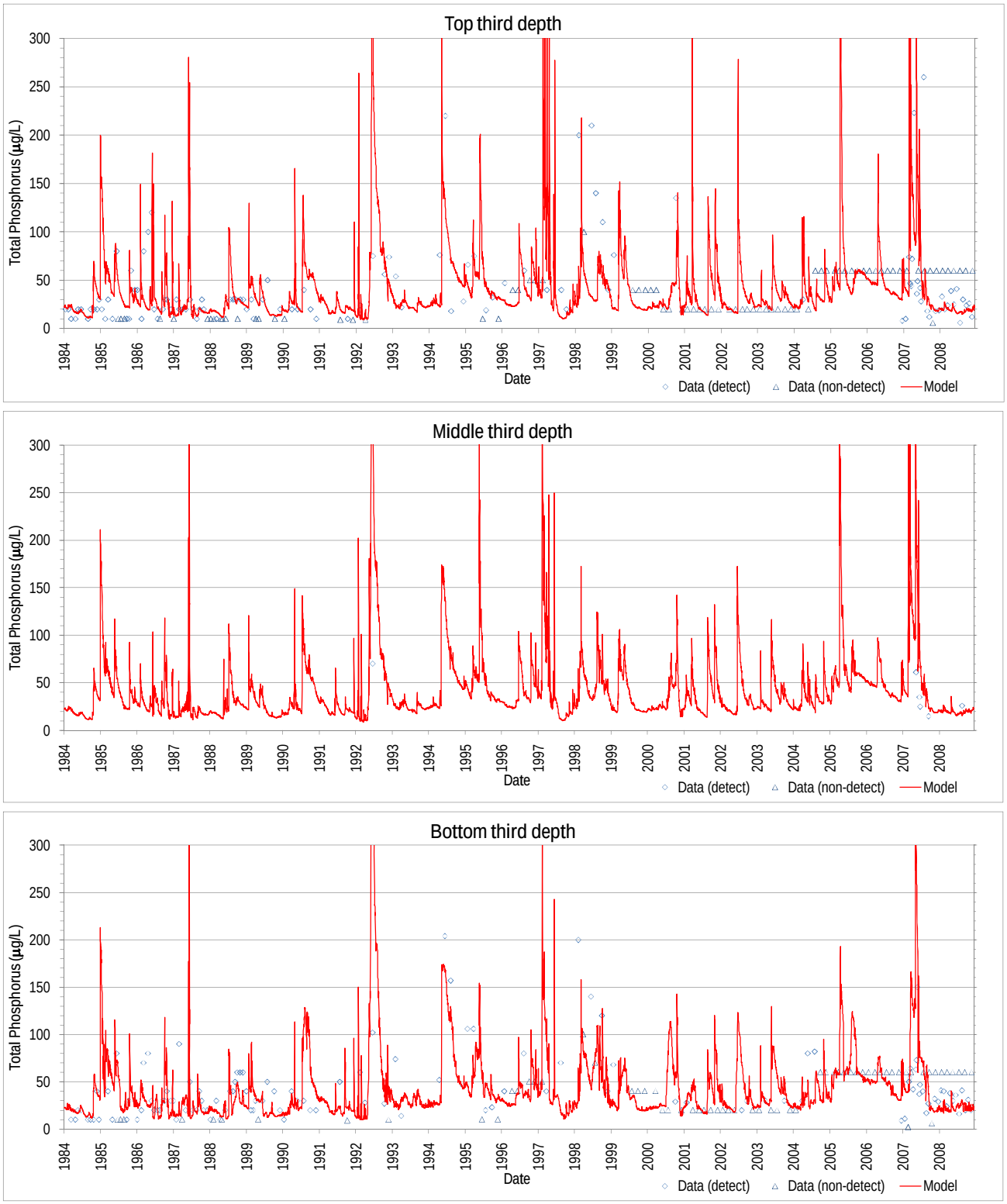


Figure 4-105 Temporal of Model versus Data for LBJ at Confluence with Sandy Creek Arm (Segment 41) - Total Phosphorus

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

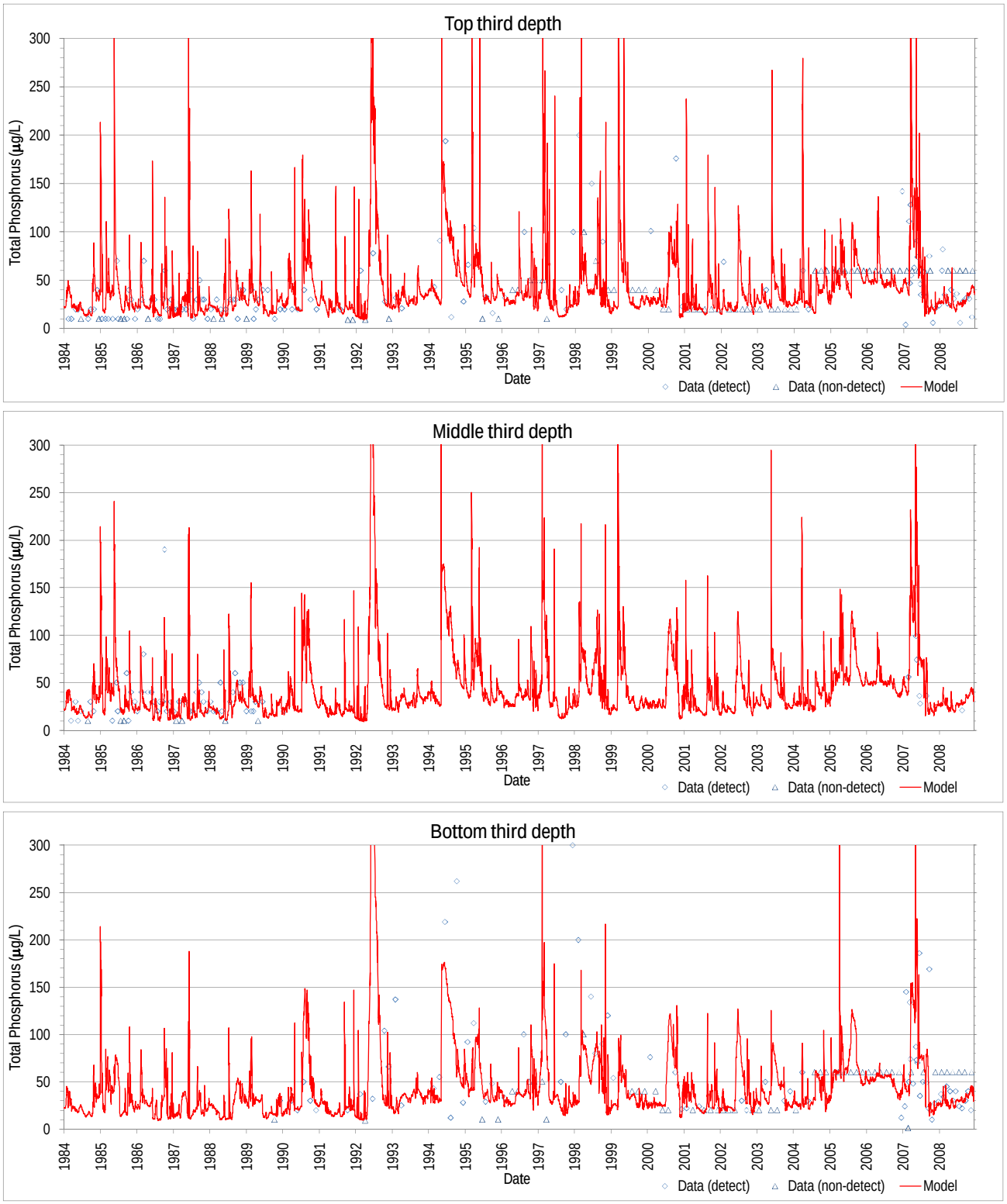


Figure 4-106 Temporal of Model versus Data for LBJ at Confluence with Llano River Arm (Segment 30) - Total Phosphorus

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

Figure 4-107 Temporal of Model versus Data for LBJ at Kingsland Cove (Segment 24) - Total Phosphorus

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

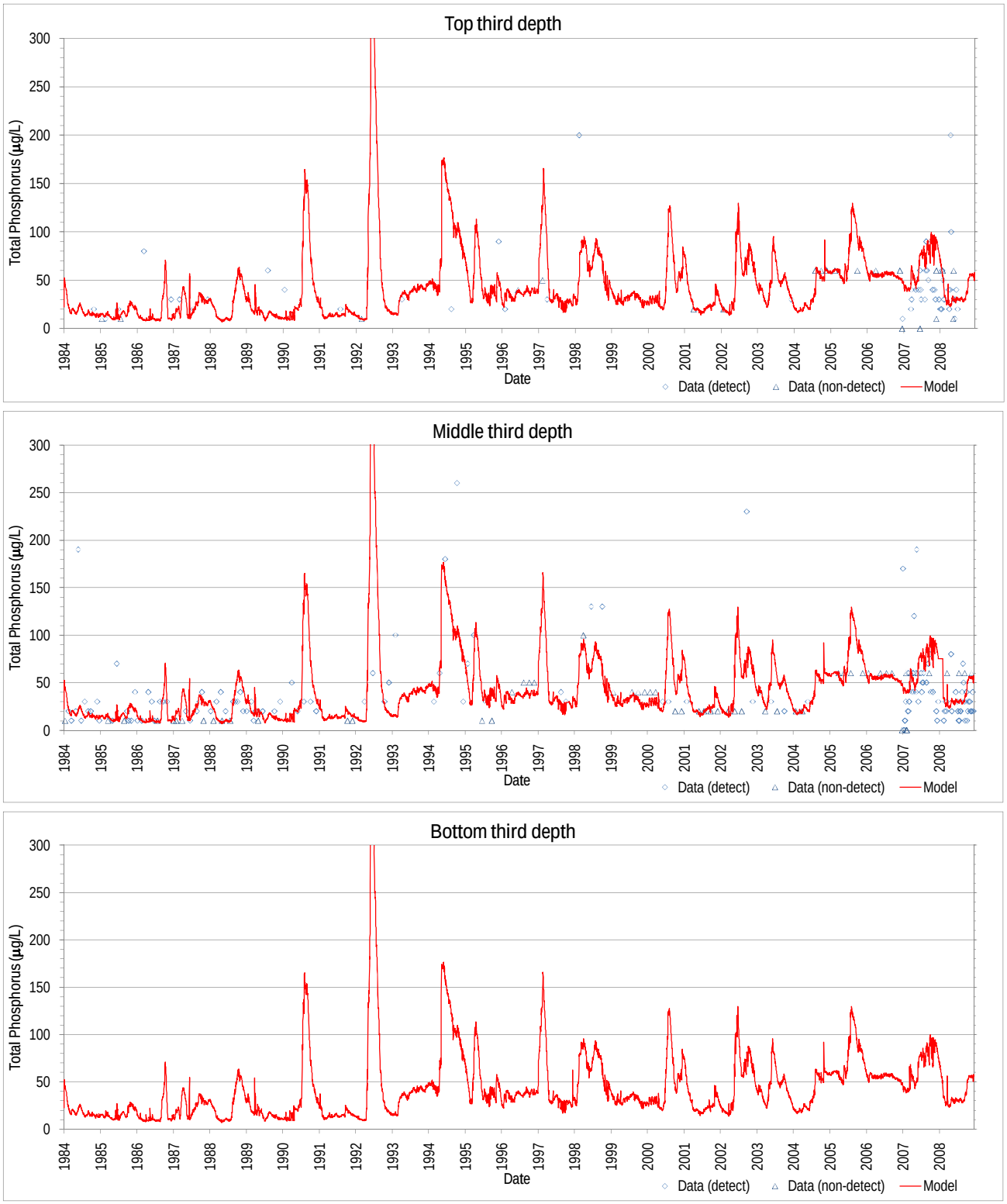


Figure 4-108 Temporal of Model versus Data for LBJ at Headwaters (Segment 2) - Total Phosphorus

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

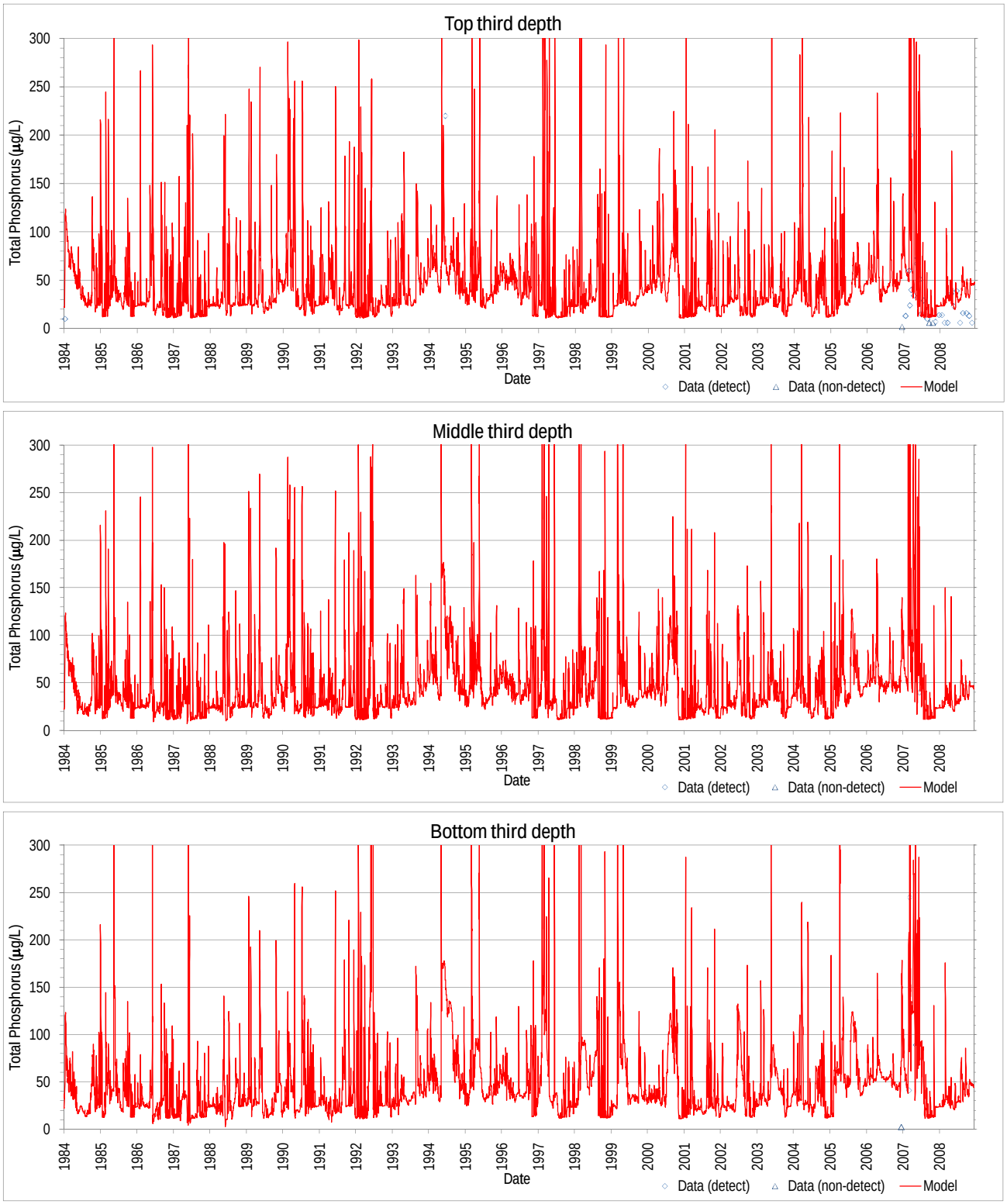


Figure 4-109 Temporal of Model versus Data for LBJ at FM 2900 (Segment 62) - Total Phosphorus

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

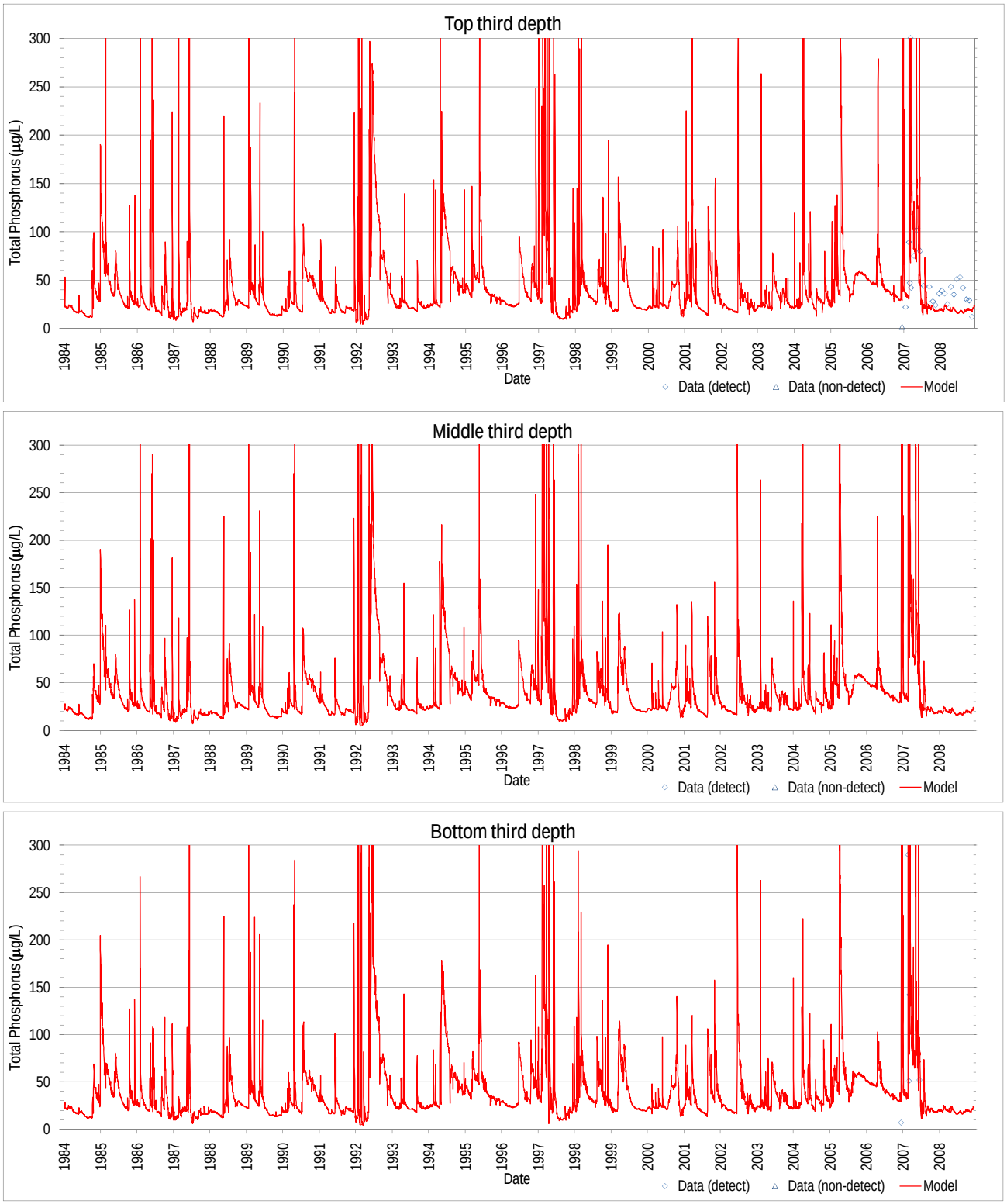


Figure 4-110 Temporal of Model versus Data for LBJ near Lake Shore Drive (Segment 78) - Total Phosphorus

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

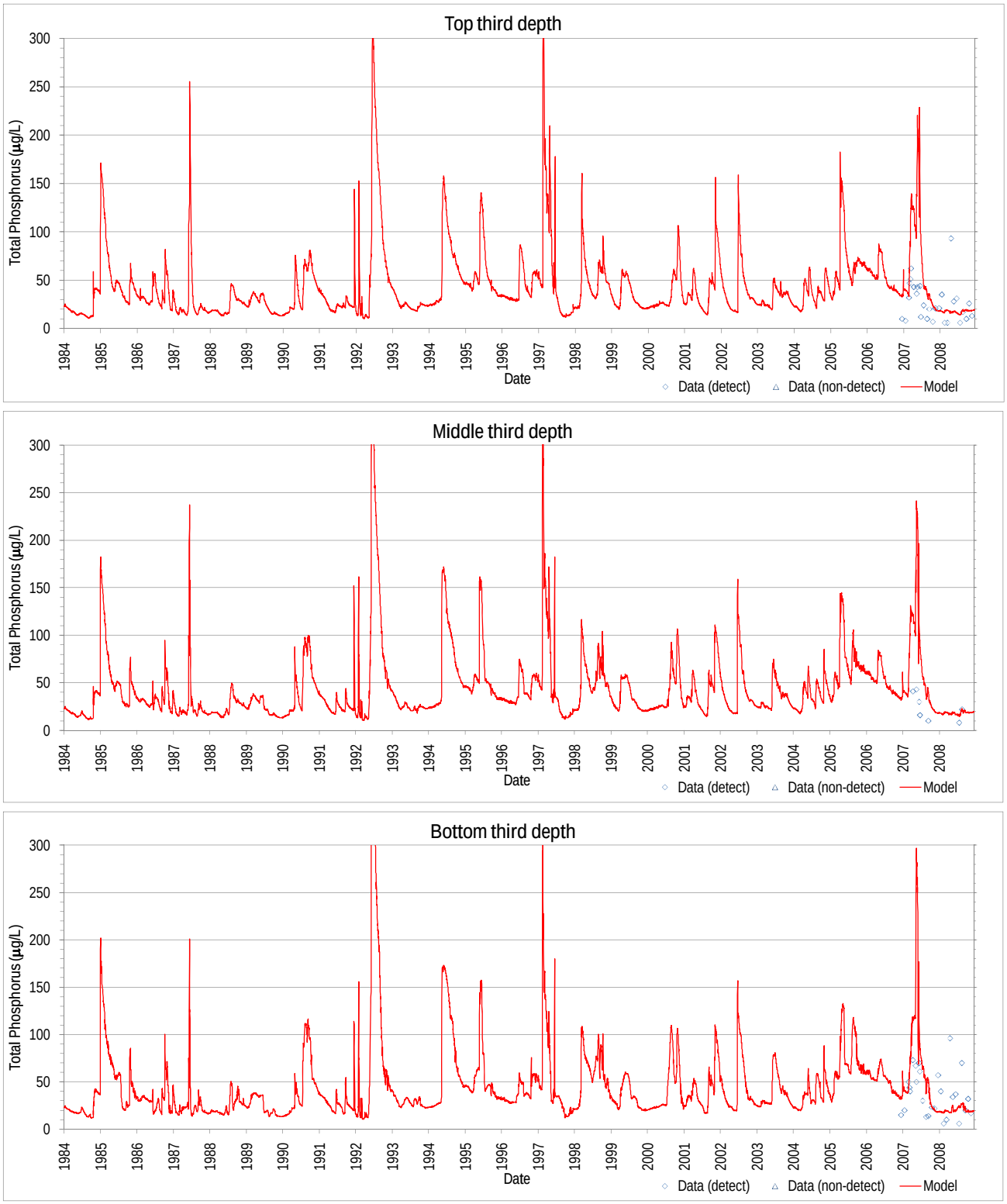


Figure 4-111 Temporal of Model versus Data for LBJ at Horseshoe Bay Cove (Segment 100) - Total Phosphorus

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

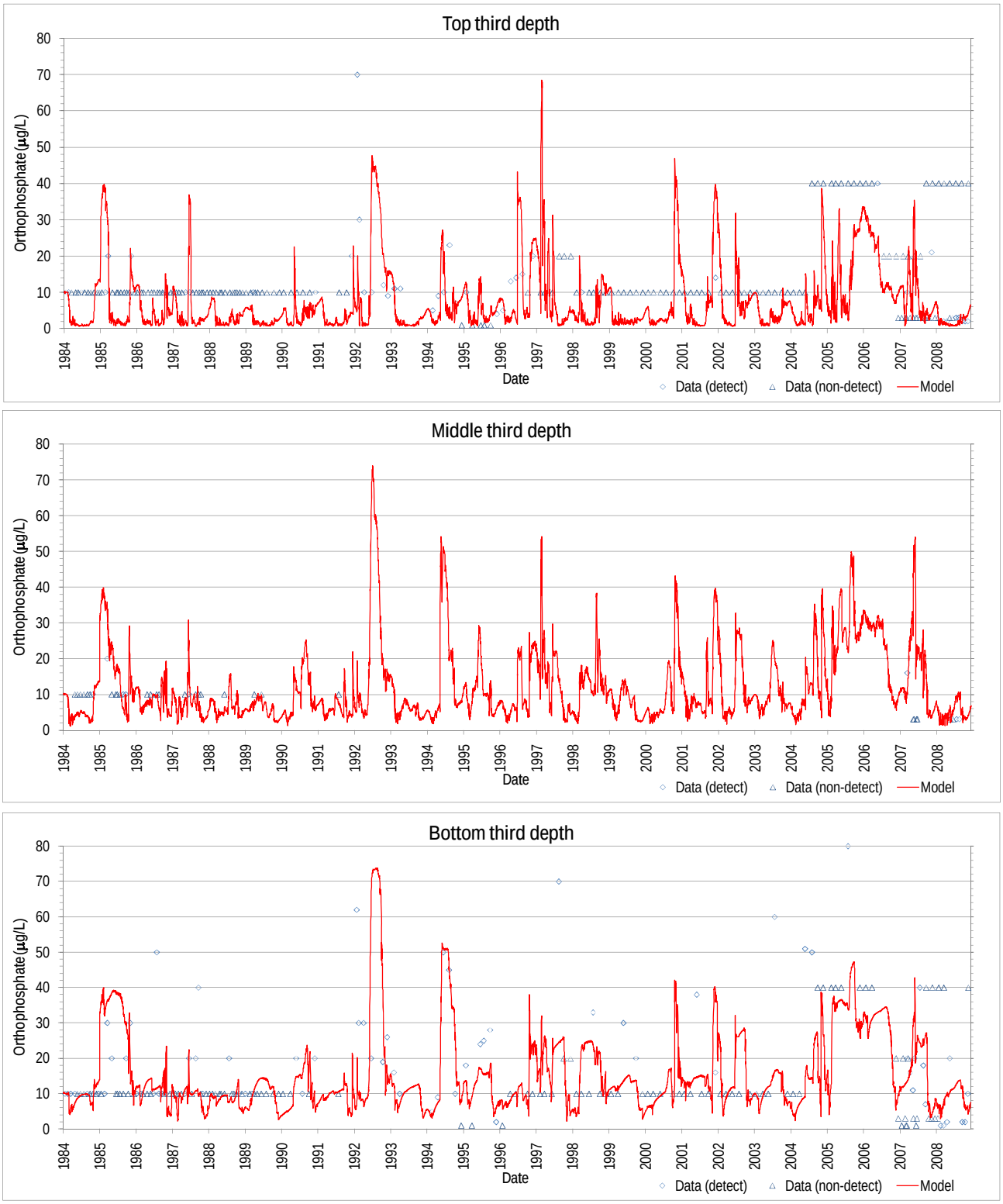


Figure 4-112 Temporal of Model versus Data for LBJ near Alvin Wirtz Dam (Segment 54) - Orthophosphate

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

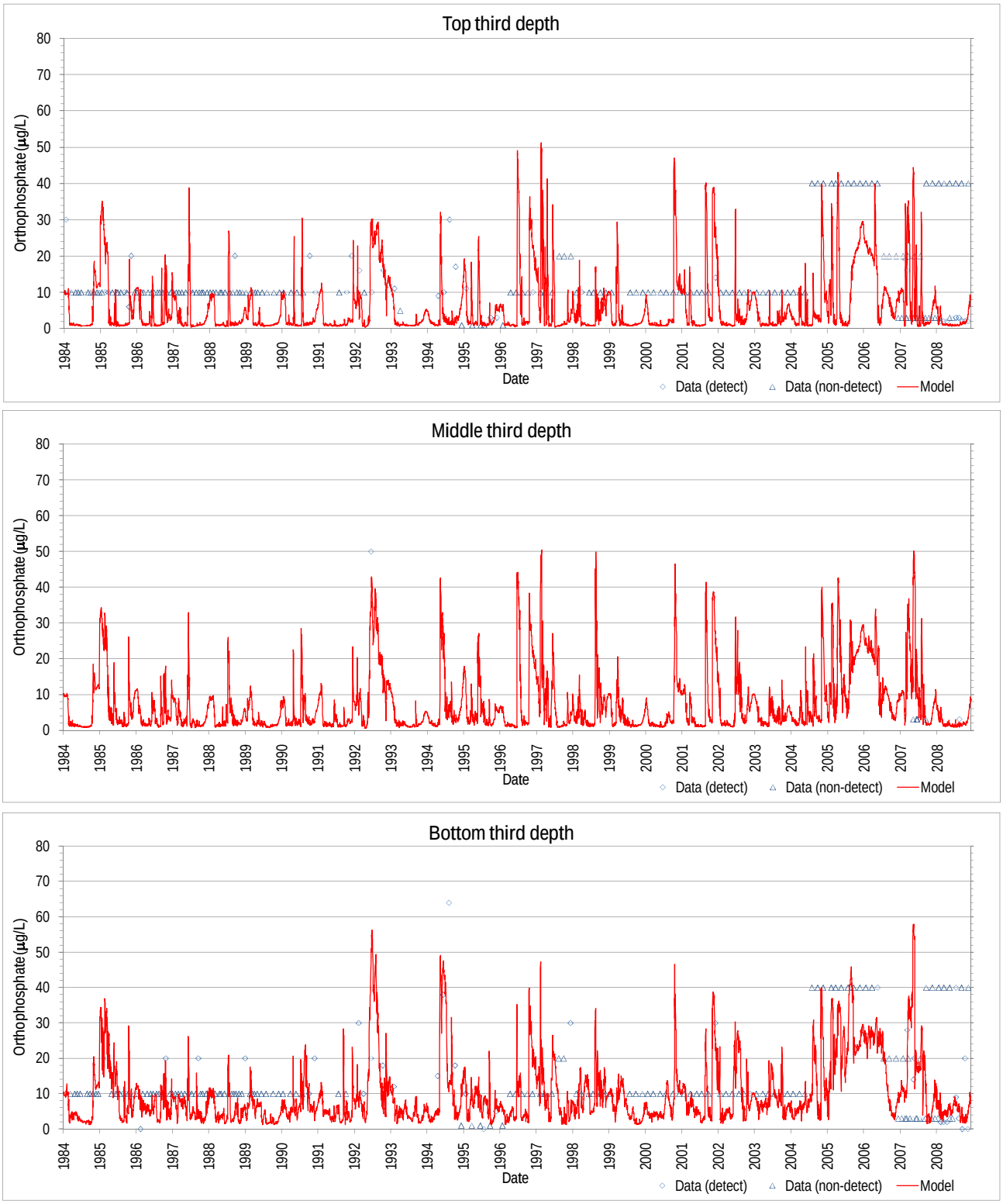


Figure 4-113 Temporal of Model versus Data for LBJ at Confluence with Sandy Creek Arm (Segment 41) - Orthophosphate

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

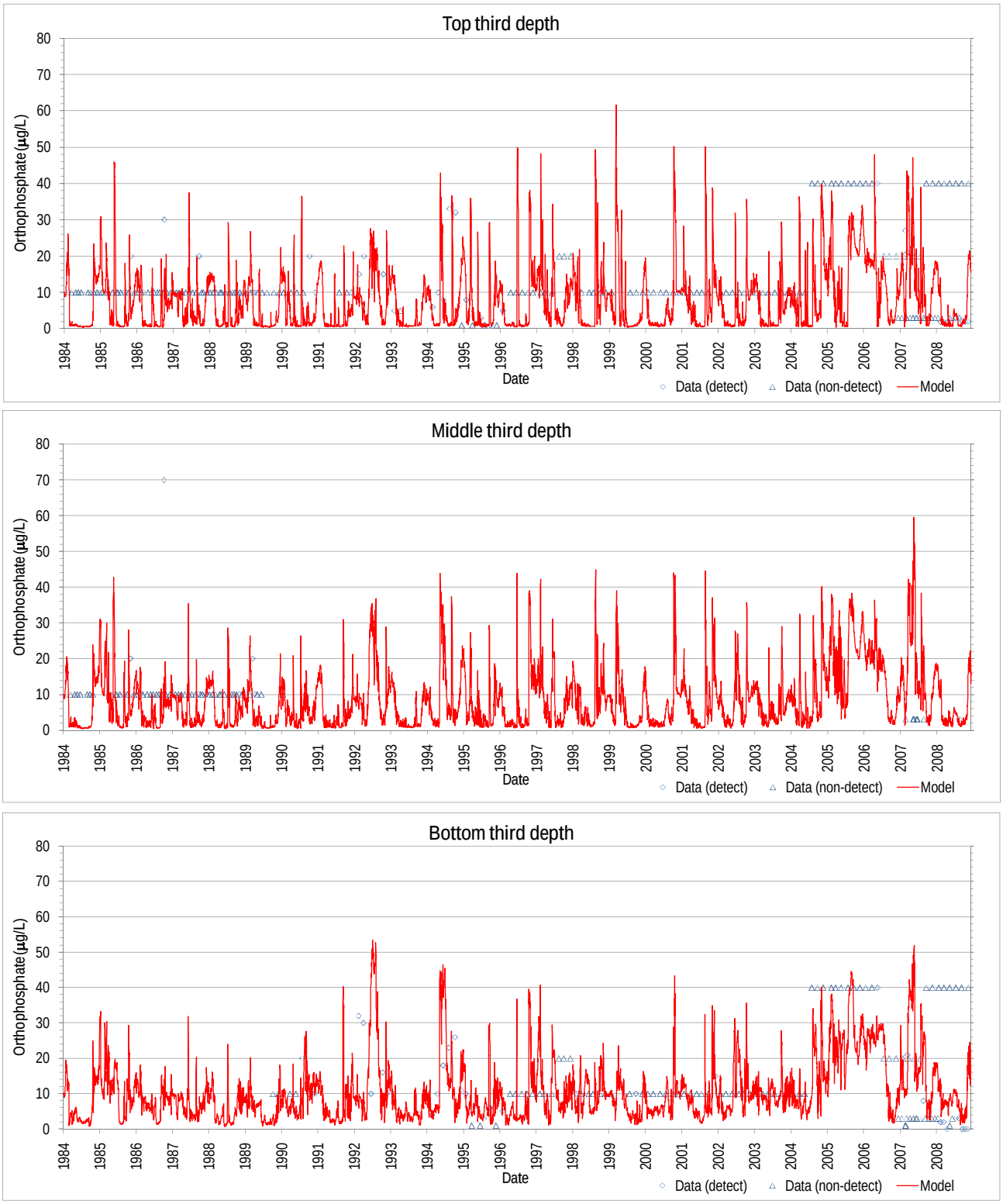


Figure 4-114 Temporal of Model versus Data for LBJ at Confluence with Llano River Arm (Segment 30) - Orthophosphate

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

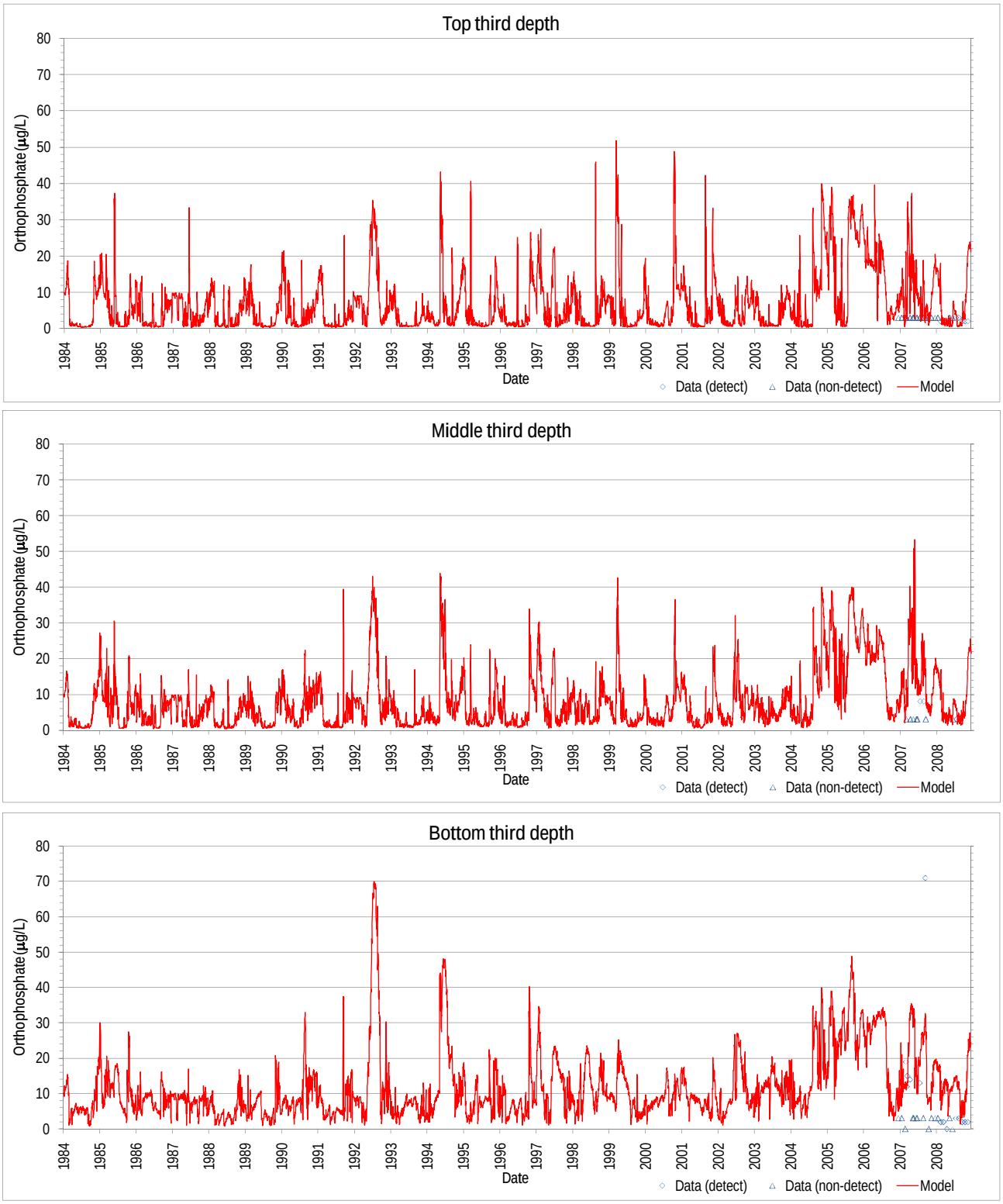


Figure 4-115 Temporal of Model versus Data for LBJ at Kingsland Cove (Segment 24) - Orthophosphate

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

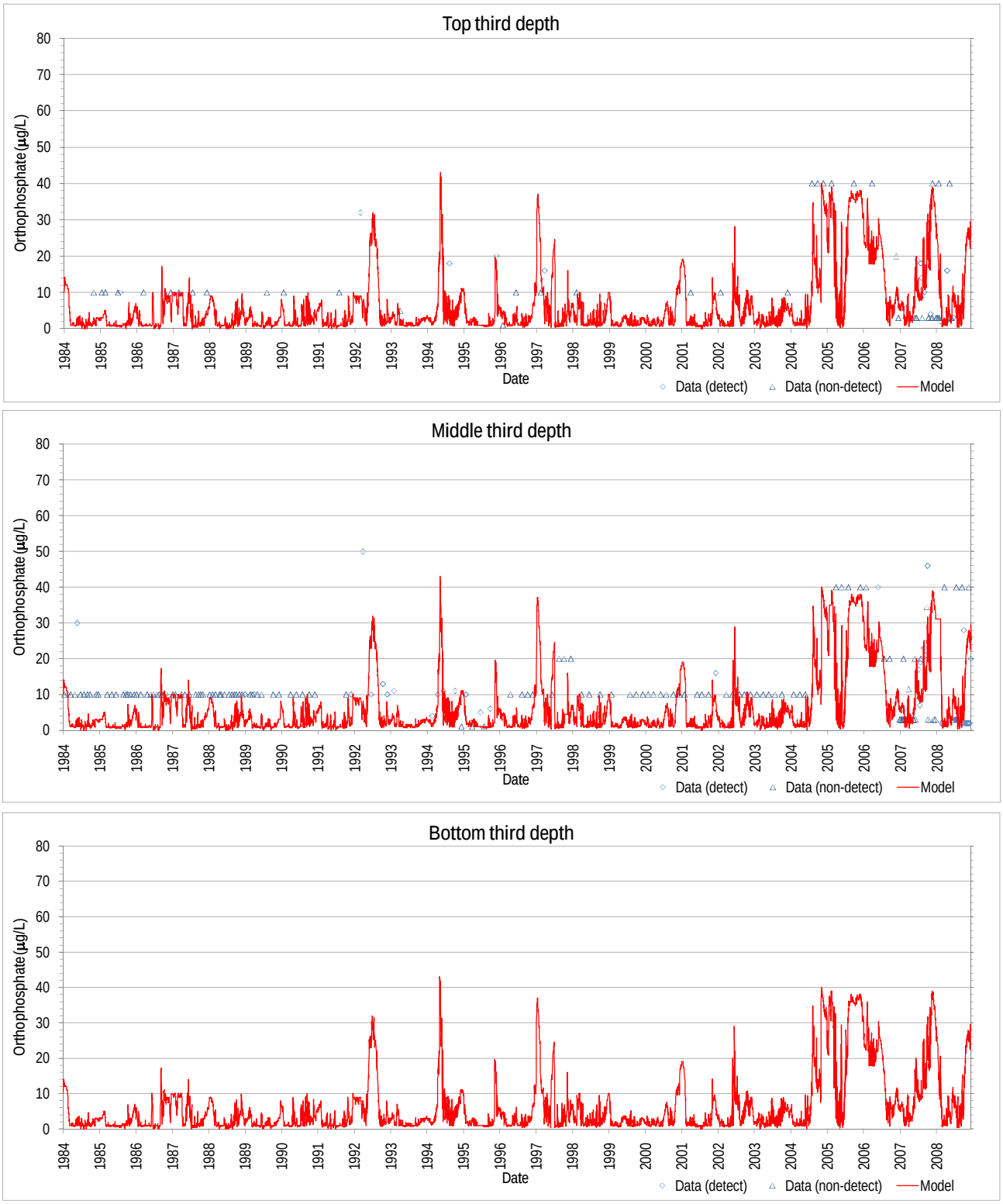


Figure 4-116 Temporal of Model versus Data for LBJ at Headwaters (Segment 2) - Orthophosphate

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

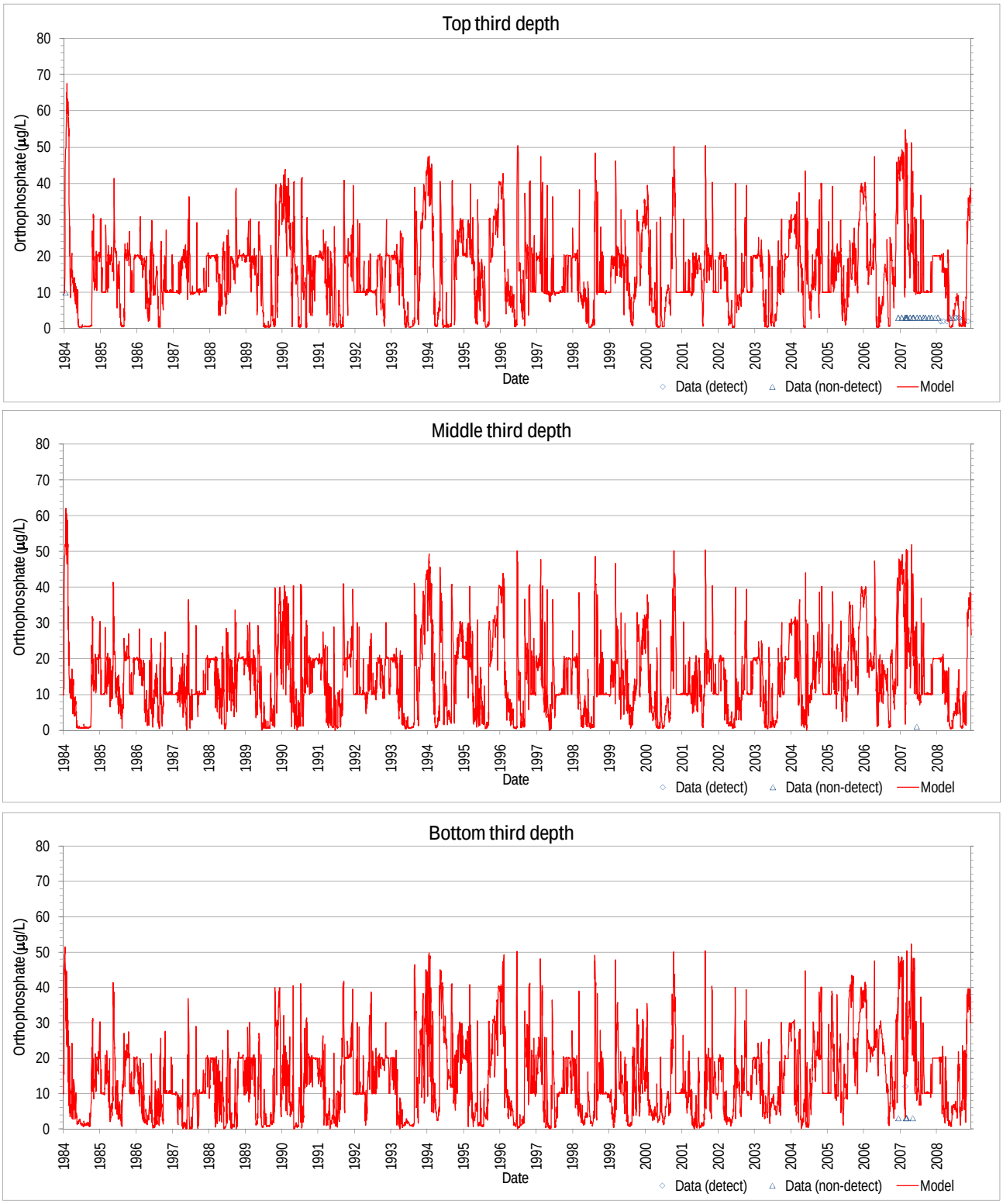


Figure 4-117 Temporal of Model versus Data for LBJ at FM 2900 (Segment 62) - Orthophosphate

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

Figure 4-118 Temporal of Model versus Data for LBJ near Lake Shore Drive (Segment 78) - Orthophosphate

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

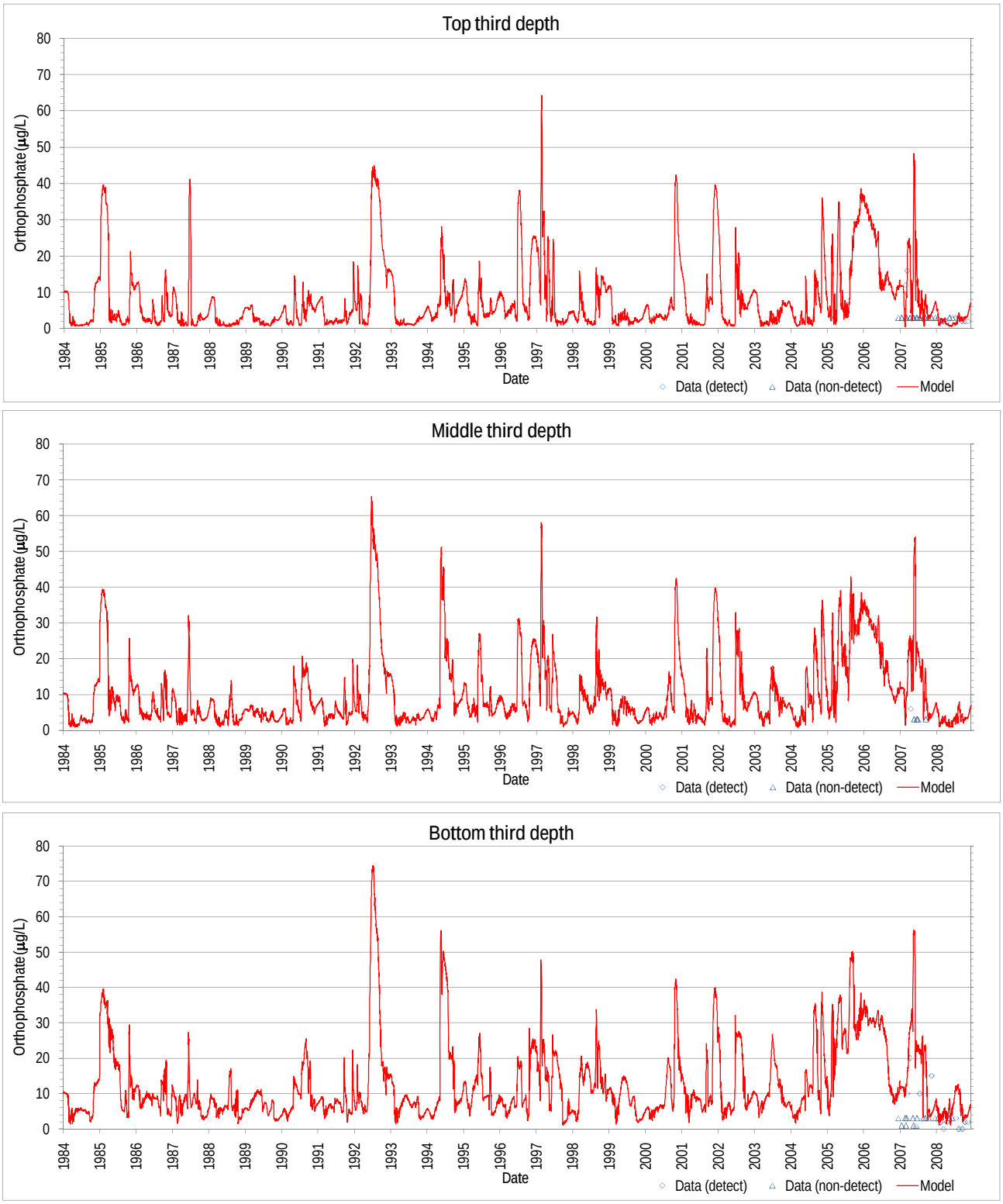


Figure 4-119 Temporal of Model versus Data for LBJ at Horseshoe Bay Cove (Segment 100) - Orthophosphate

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

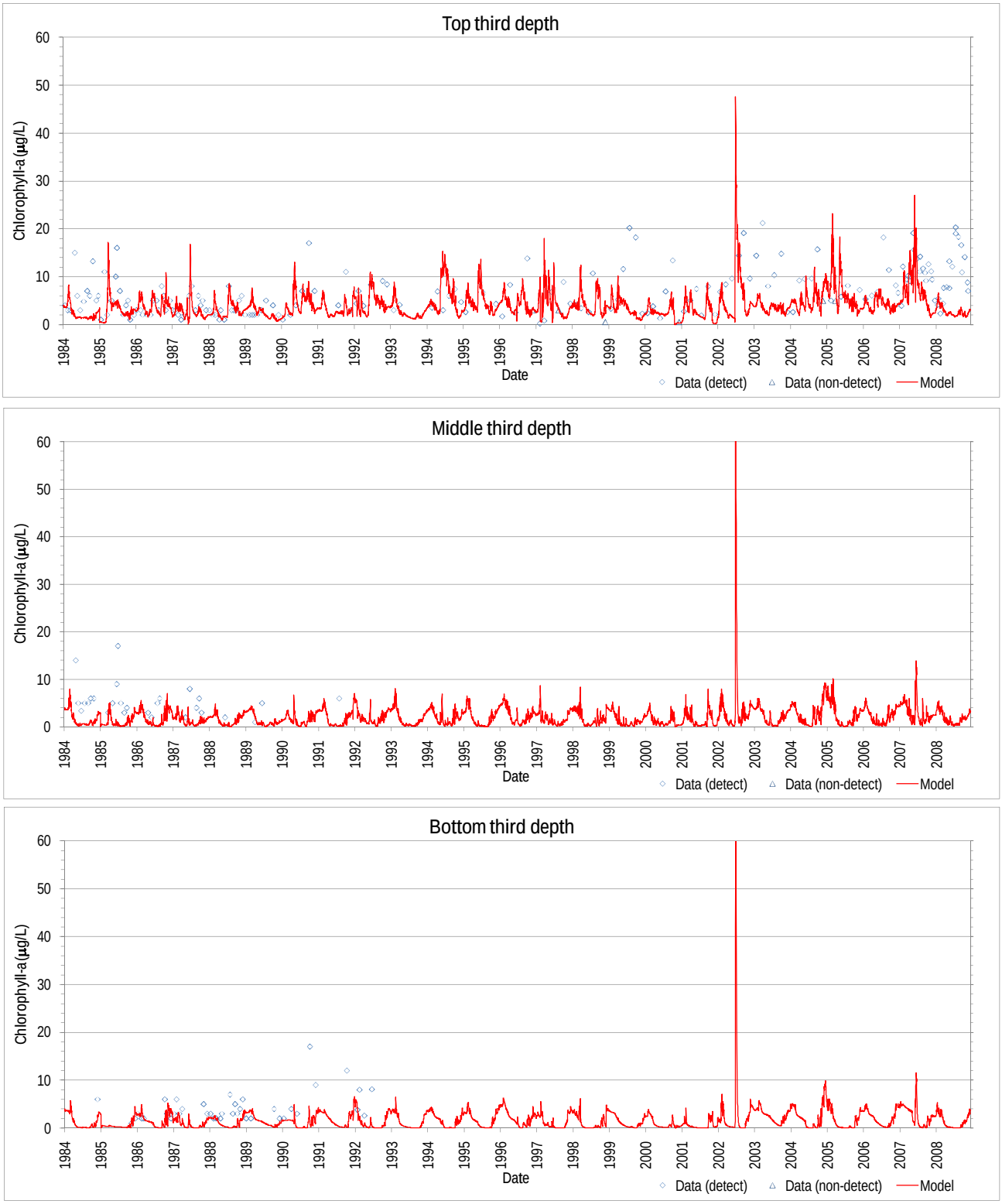


Figure 4-120 Temporal of Model versus Data for LBJ near Alvin Wirtz Dam (Segment 54) - Chlorophyll a

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

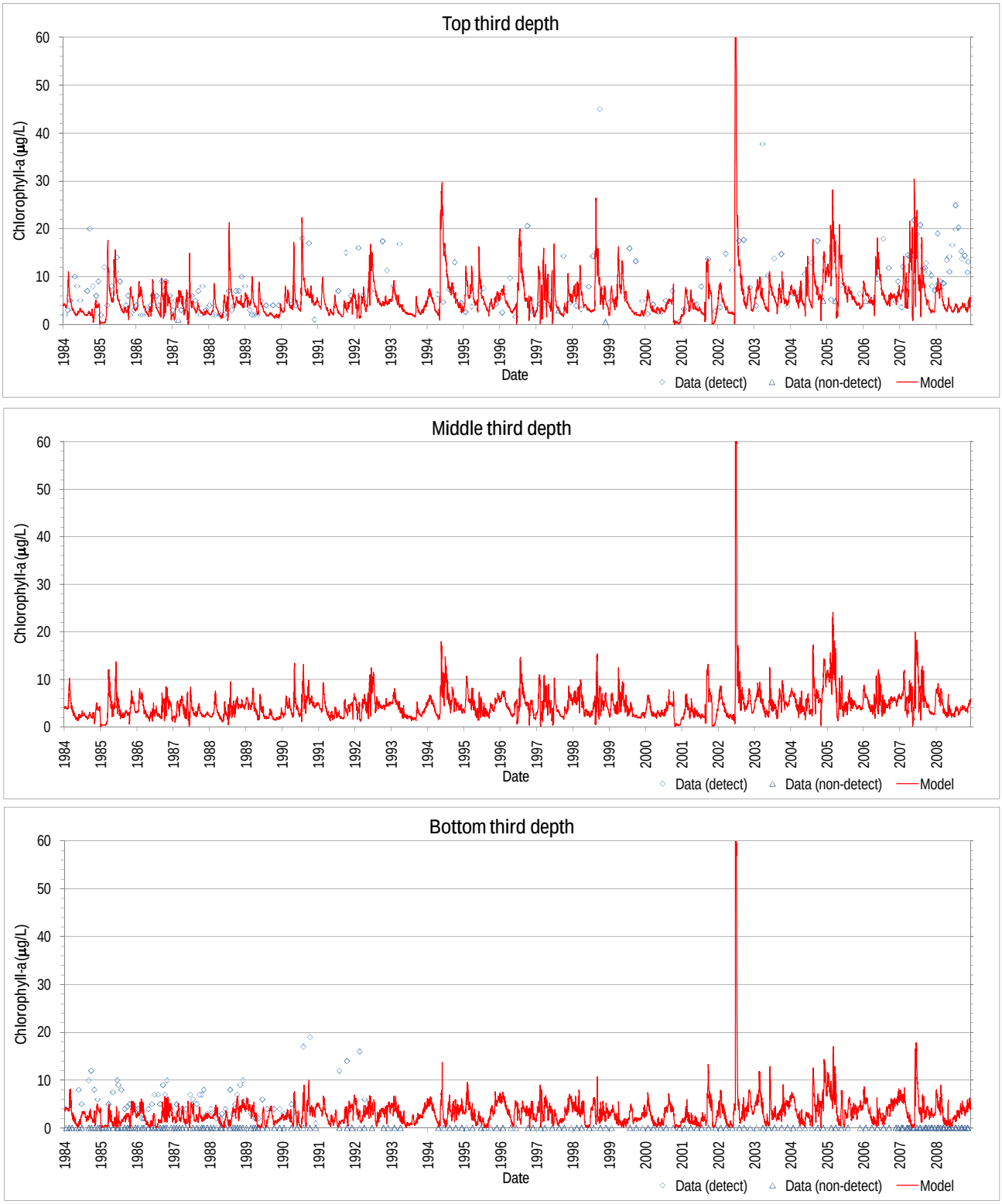


Figure 4-121 Temporal of Model versus Data for LBJ at Confluence with Sandy Creek Arm (Segment 41) - Chlorophyll a

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

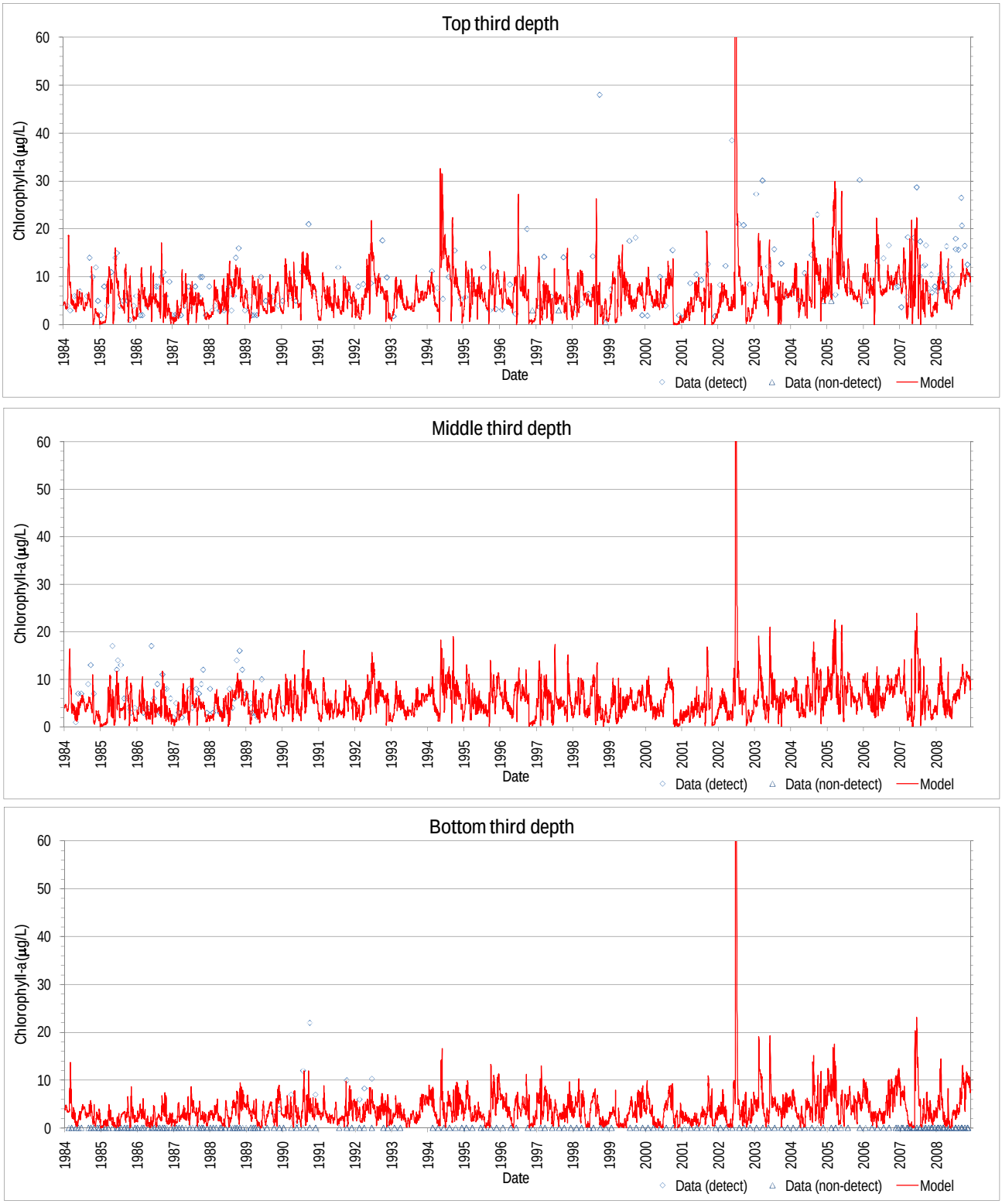


Figure 4-122 Temporal of Model versus Data for LBJ at Confluence with Llano River Arm (Segment 30) - Chlorophyll a

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

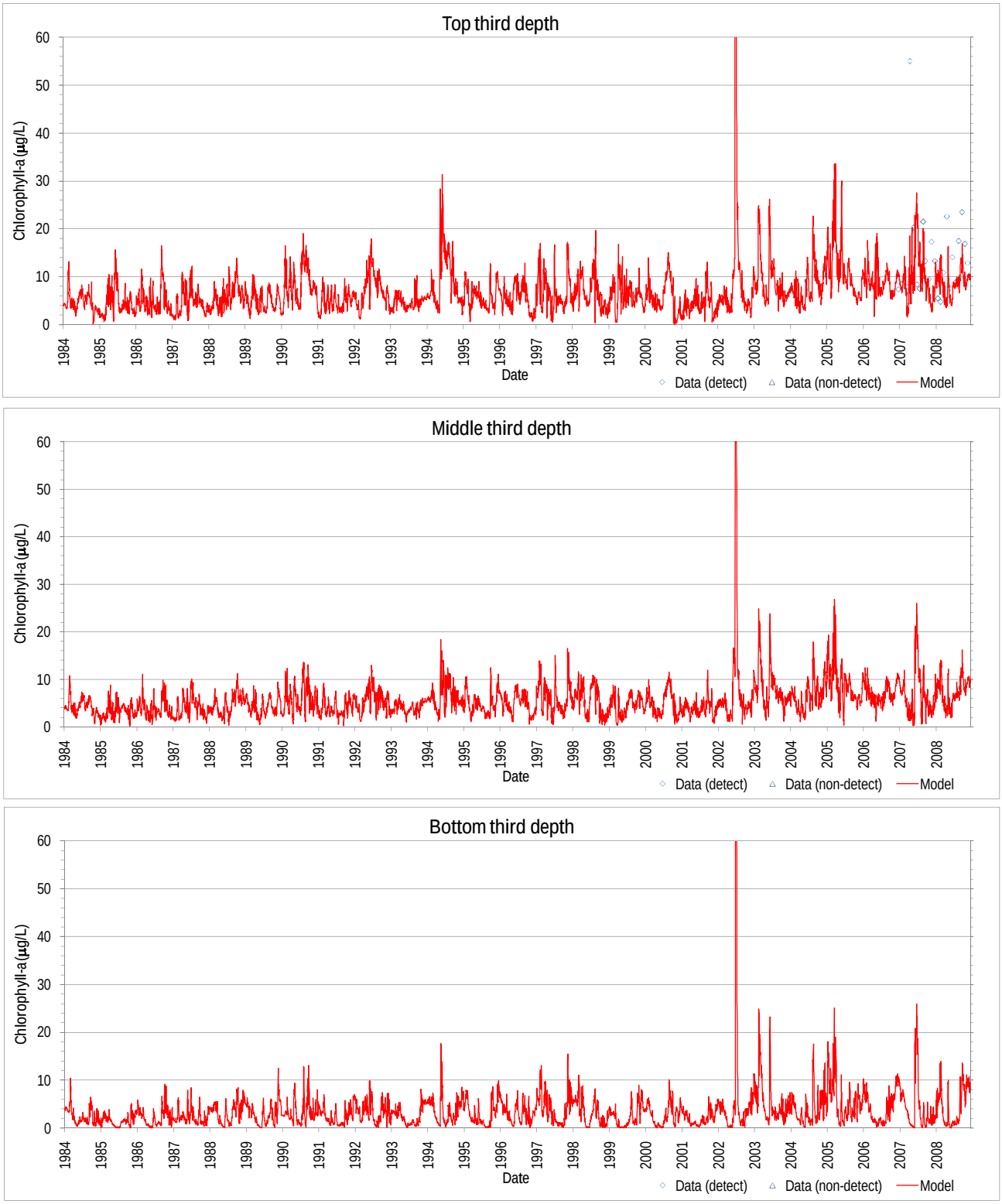


Figure 4-123 Temporal of Model versus Data for LBJ at Kingsland Cove (Segment 24) - Chlorophyll a

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

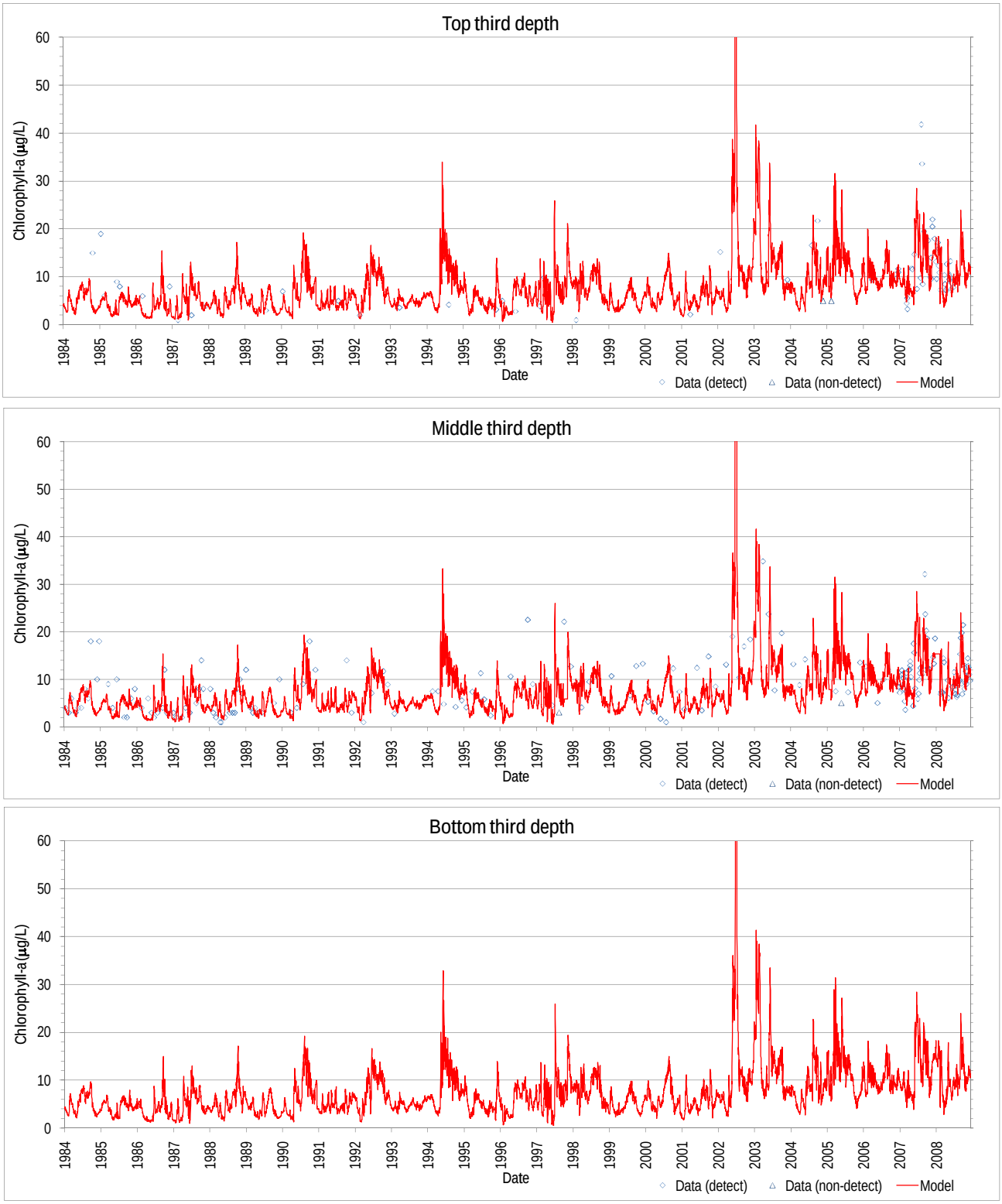


Figure 4-124 Temporal of Model versus Data for LBJ at Headwaters (Segment 2) - Chlorophyll a

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

Figure 4-125 Temporal of Model versus Data for LBJ at FM 2900 (Segment 62) - Chlorophyll a

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

Figure 4-126 Temporal of Model versus Data for LBJ near Lake Shore Drive (Segment 78) - Chlorophyll a

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

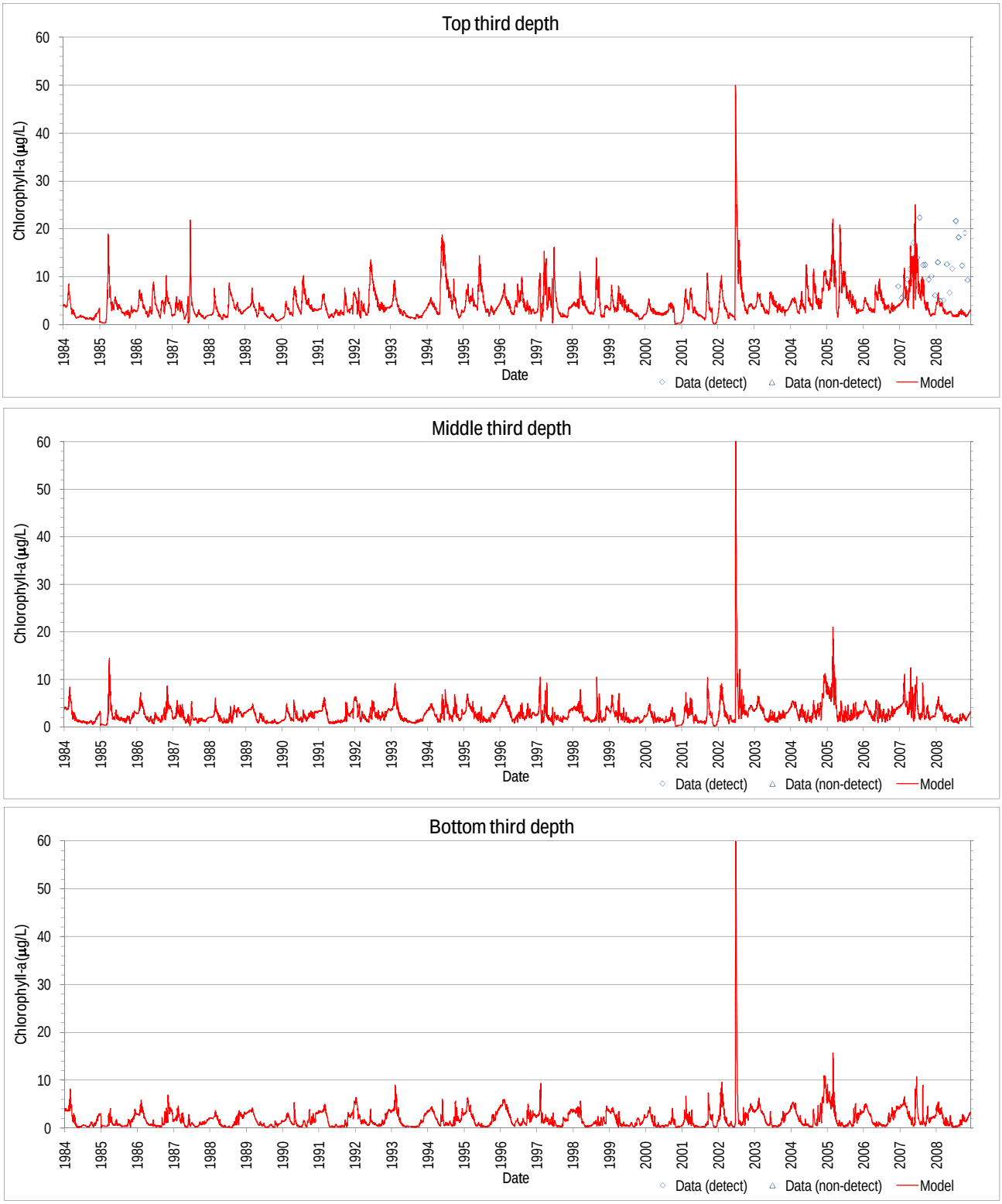


Figure 4-127 Temporal of Model versus Data for LBJ at Horseshoe Bay Cove (Segment 100) - Chlorophyll a

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

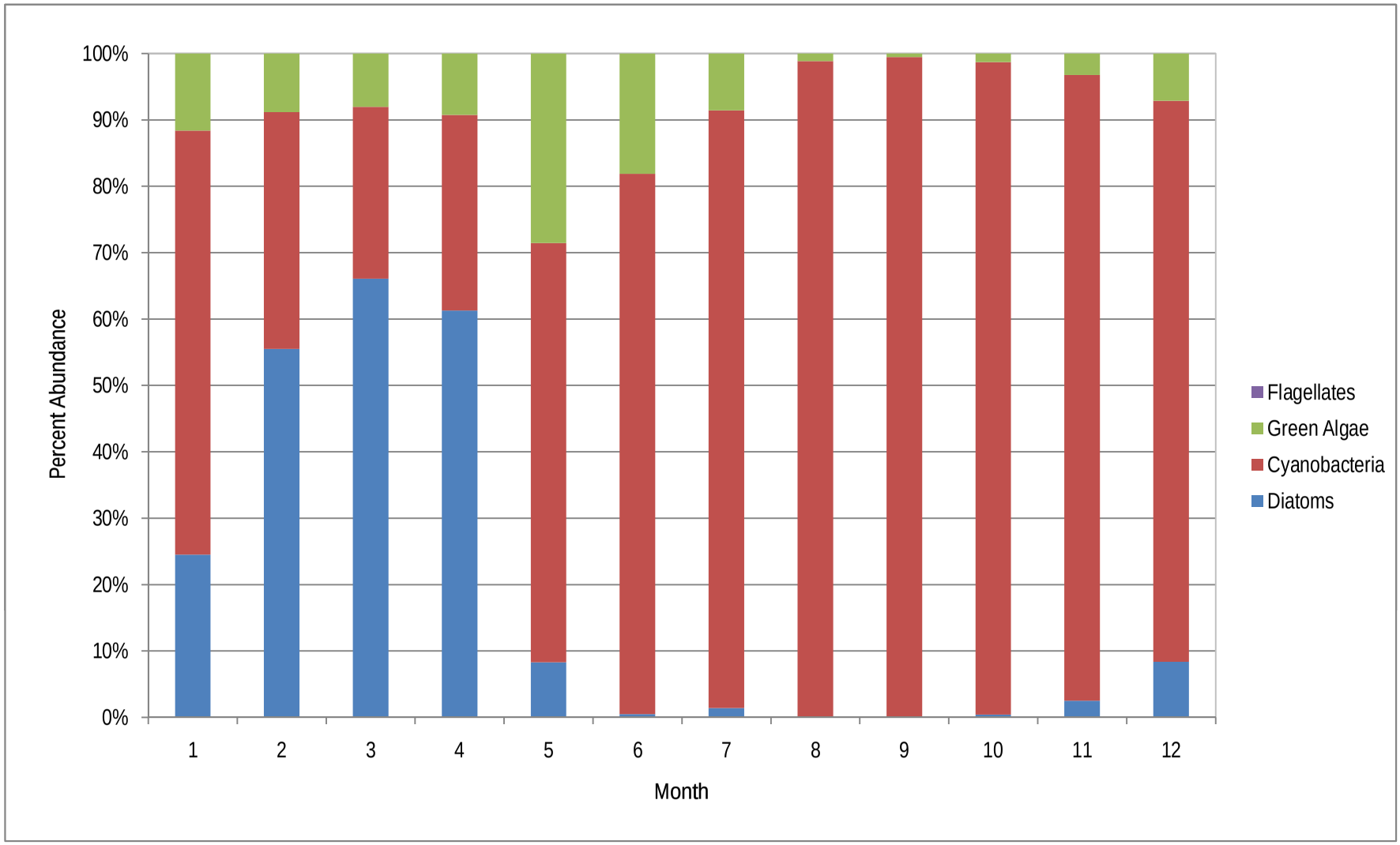


Figure 4-128 Predicted Seasonal Abundances of Major Algal Groups at Lake LBJ near Wirtz Dam

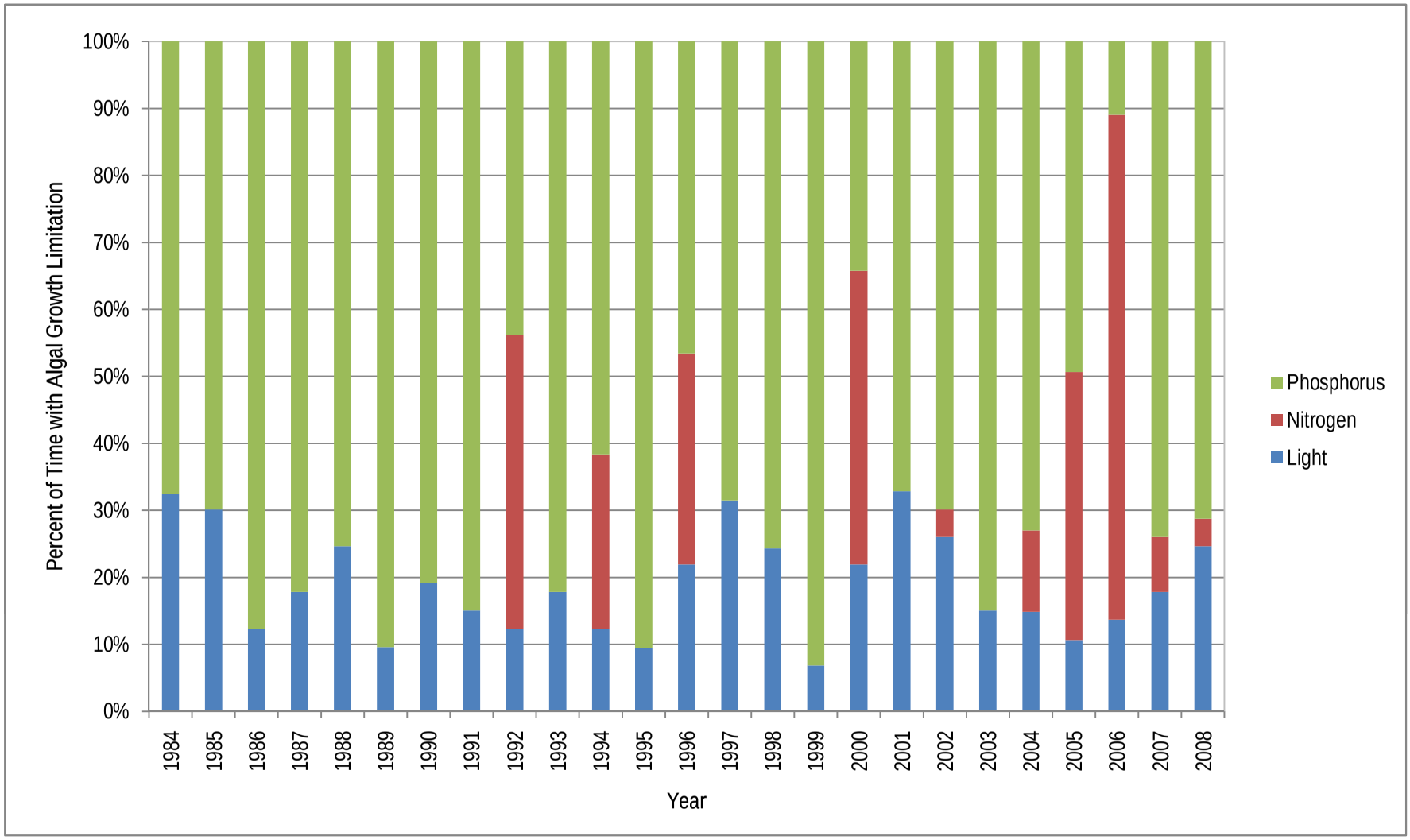


Figure 4-129 Algal Growth Limiting factors by Year at Lake LBJ near Wirtz Dam

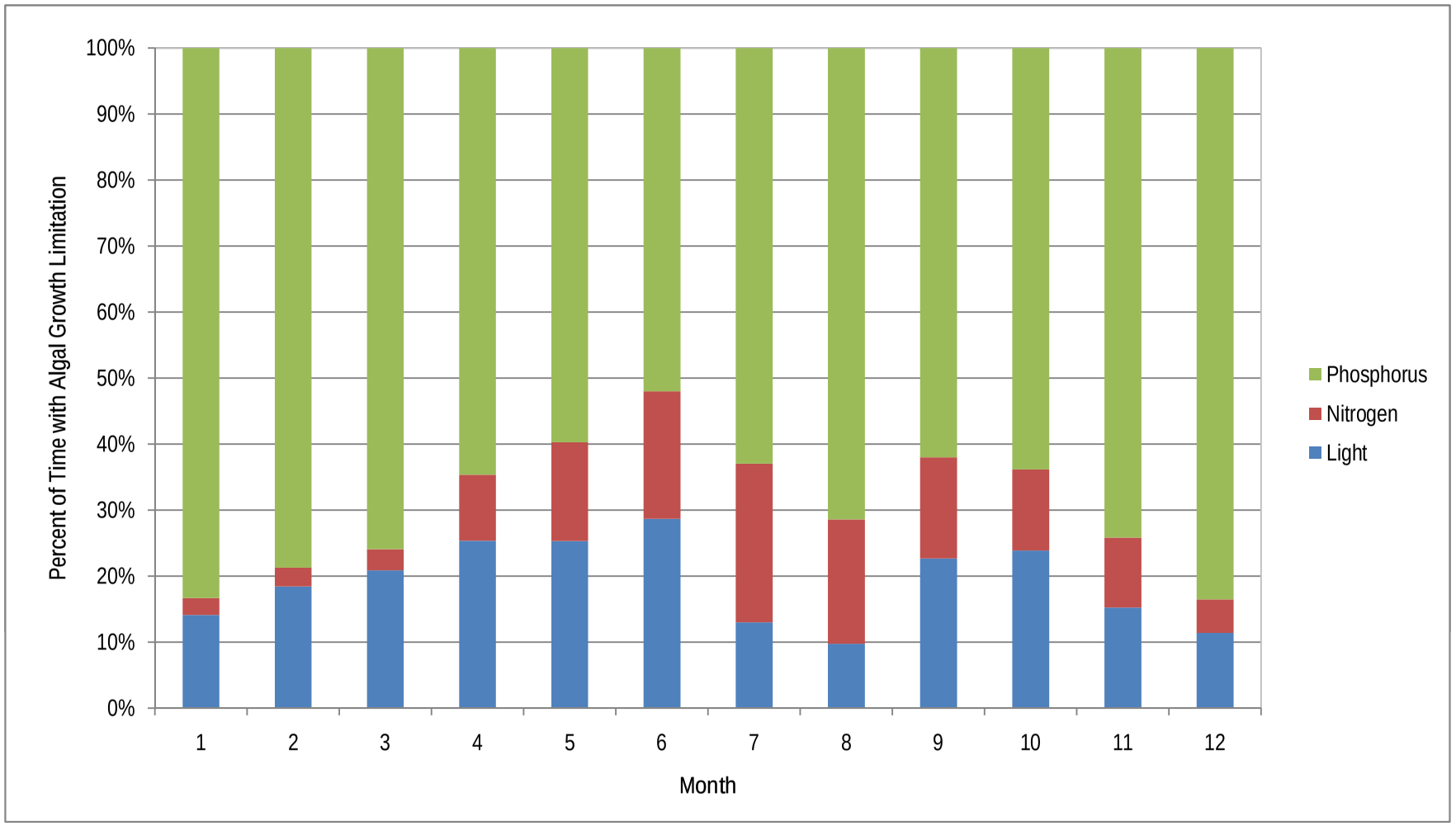


Figure 4-130 Algal Growth Limiting factors by Month at Lake LBJ near Wirtz Dam

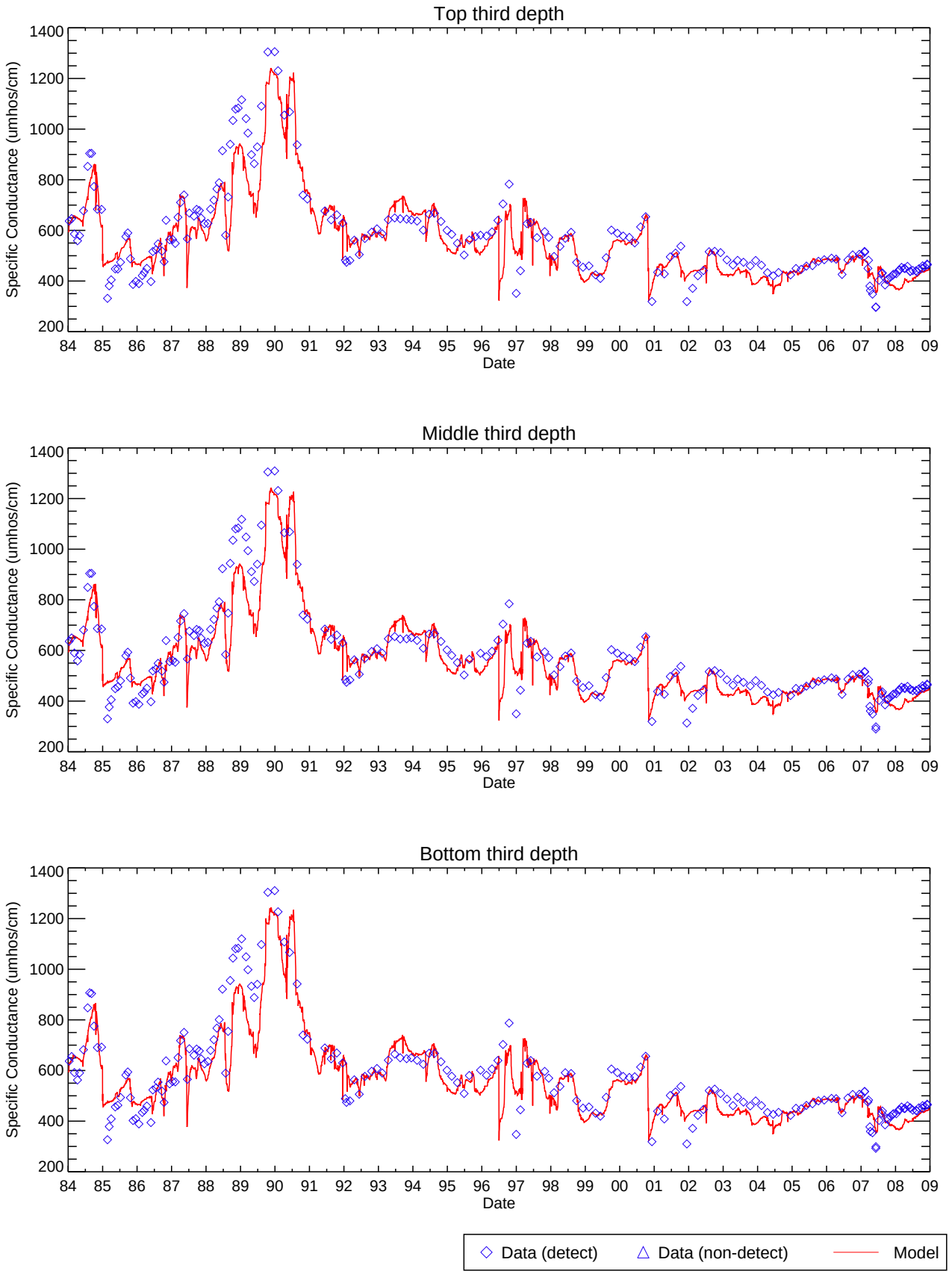


Figure 4-131 Temporal of Model versus Data for Lake Marble Falls near Max Starcke Dam (Segment 26) - Specific Conductance

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

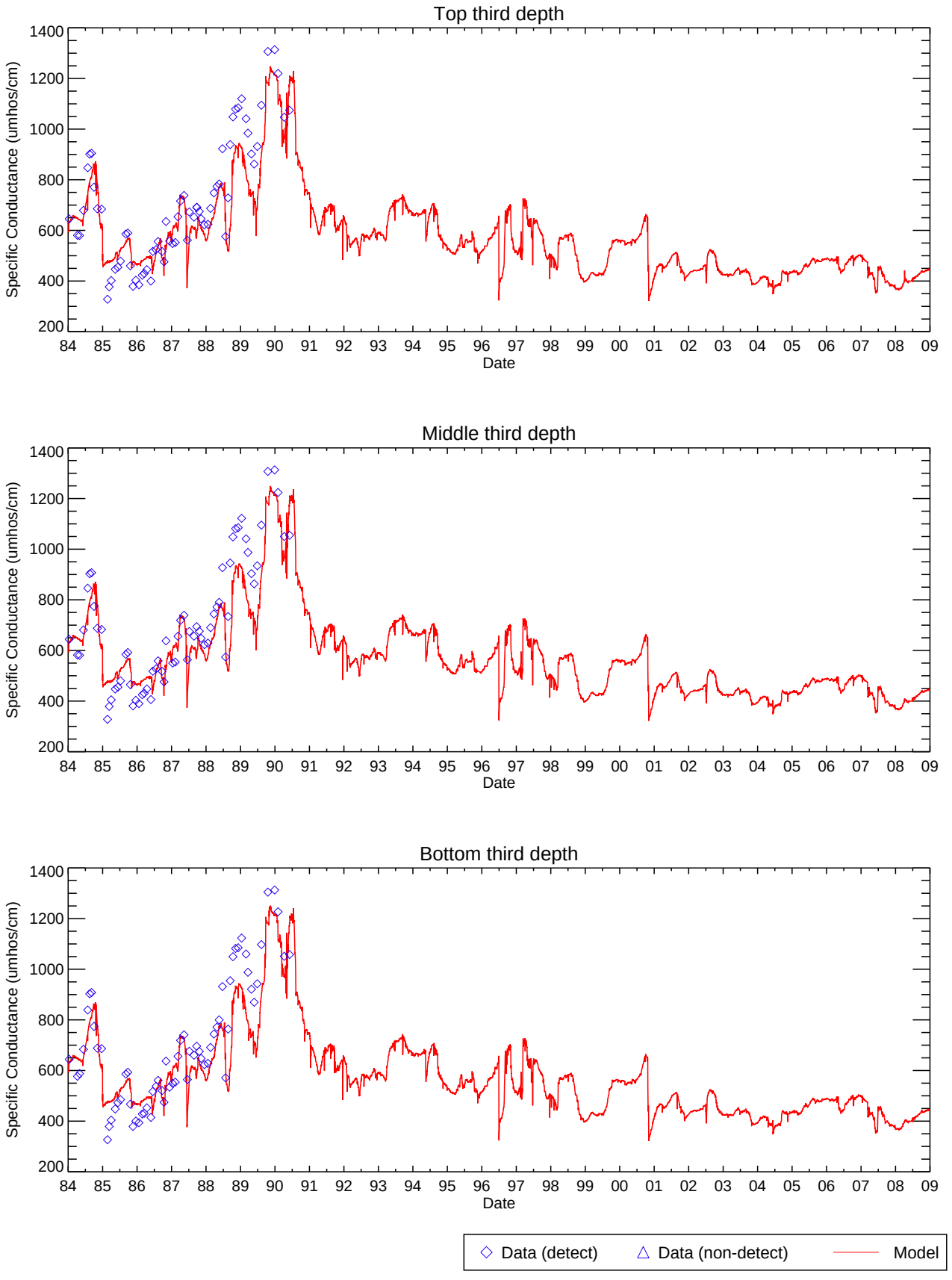


Figure 4-132 Temporal of Model versus Data for Lake Marble Falls near US 281 Bridge (Segment 20) - Specific Conductance

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

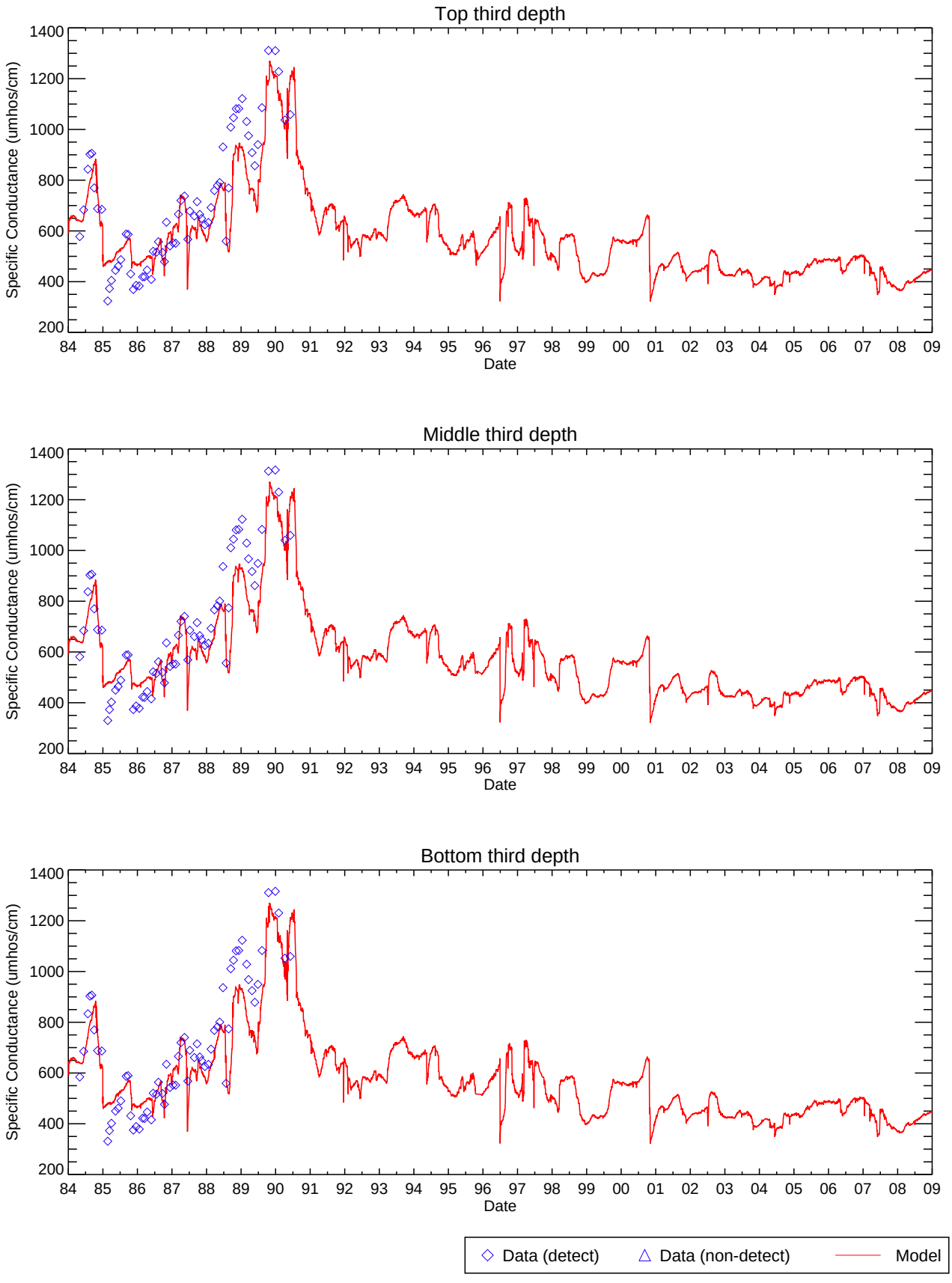


Figure 4-133 Temporal of Model versus Data for Lake Marble Falls at Hefner Ranch (Segment 11) - Specific Conductance

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

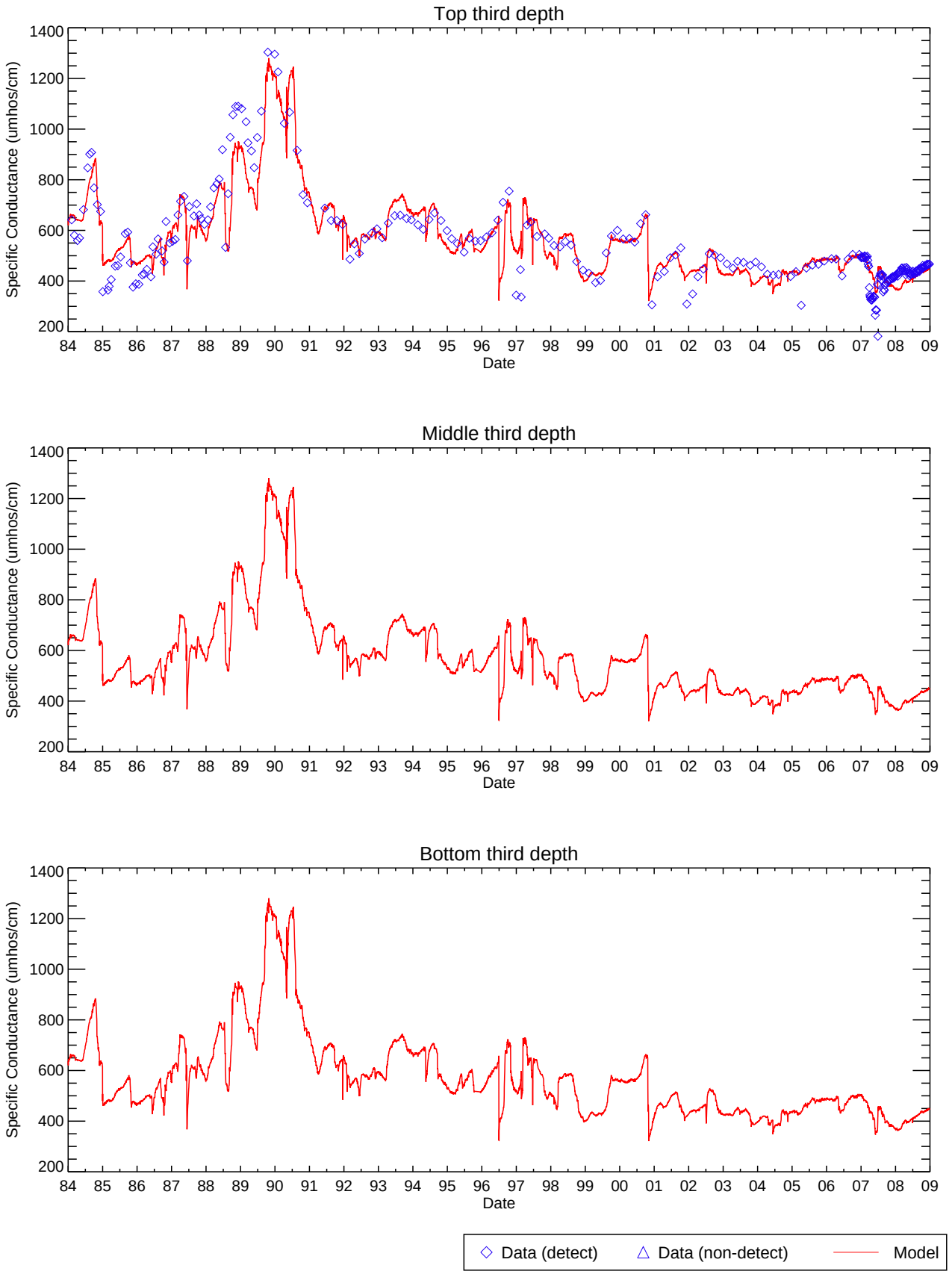


Figure 4-134 Temporal of Model versus Data for Lake Marble Falls at Headwaters (Segment 2) - Specific Conductance

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

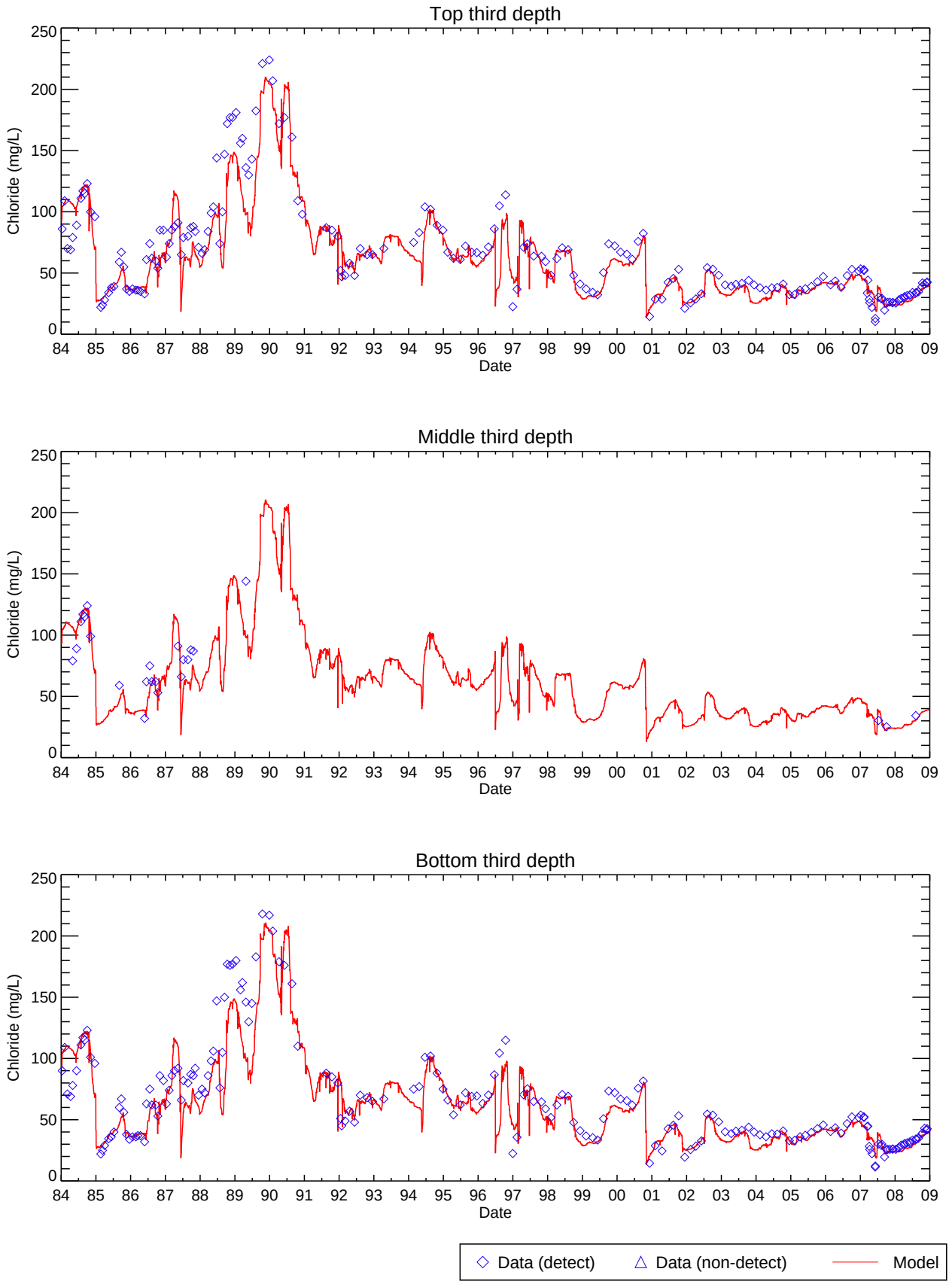


Figure 4-135 Temporal of Model versus Data for Lake Marble Falls near Max Starcke Dam (Segment 26) - Chloride

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

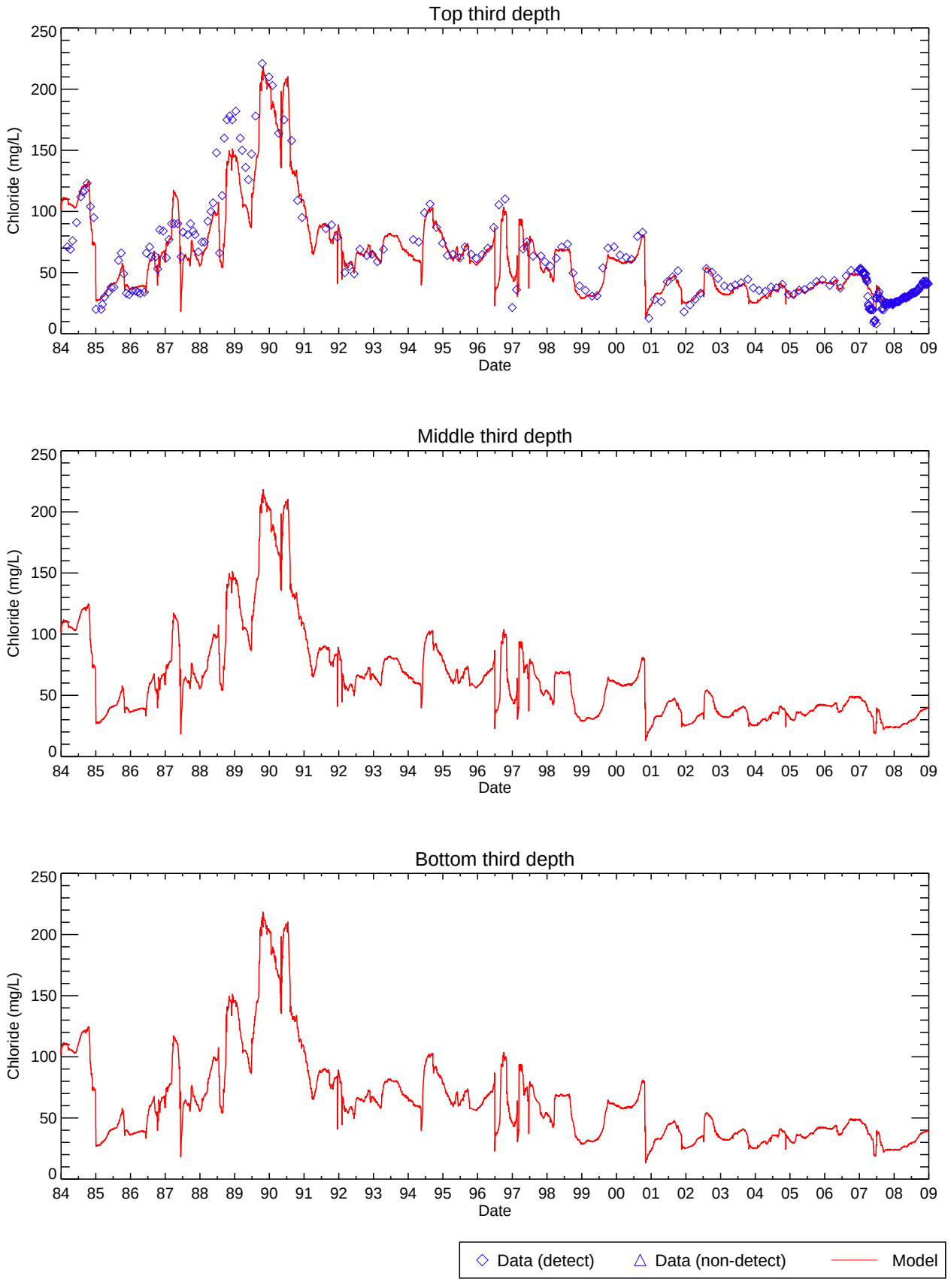


Figure 4-136 Temporal of Model versus Data for Lake Marble Falls at Headwaters (Segment 2) - Chloride

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

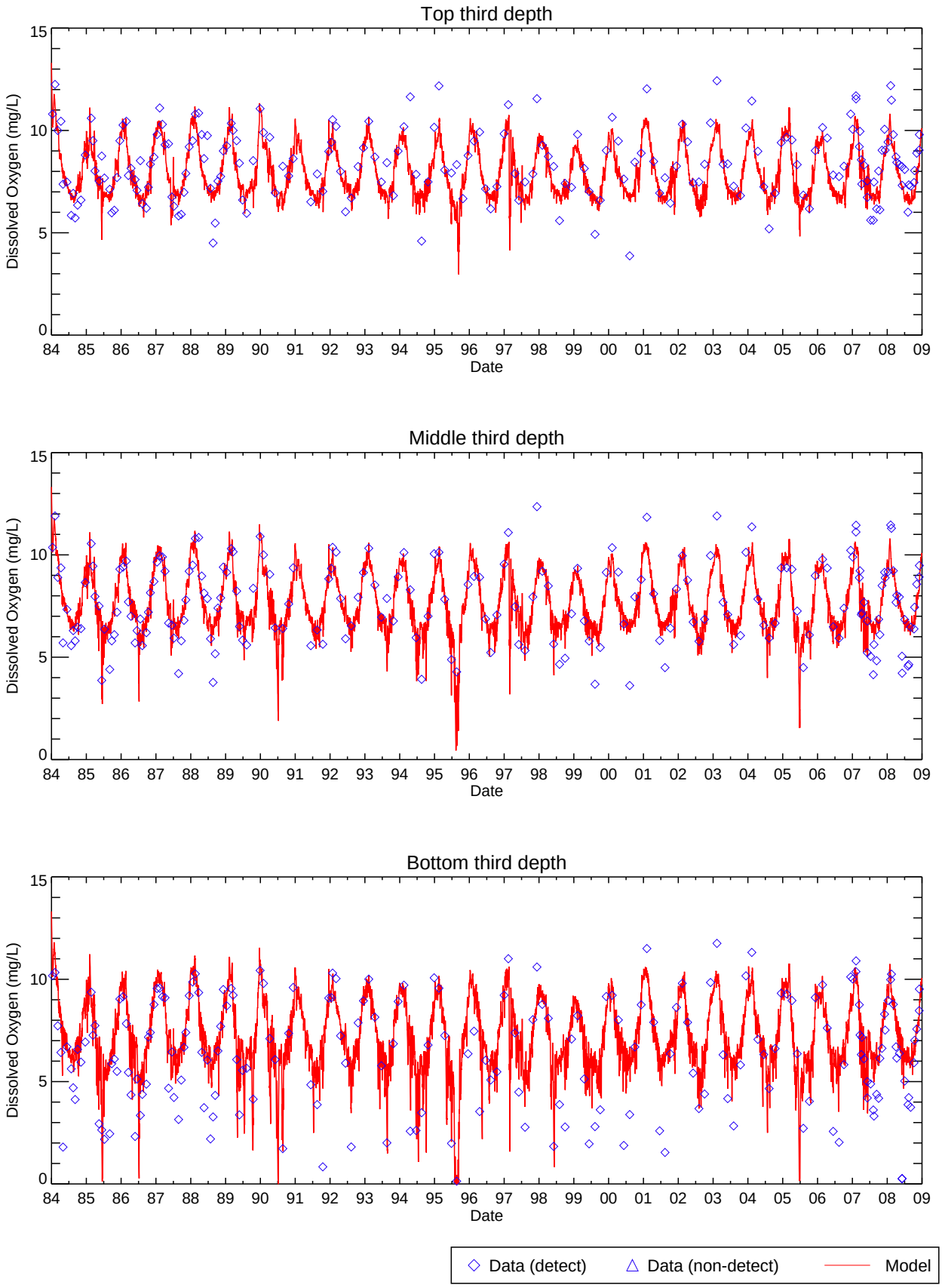


Figure 4-137 Temporal of Model versus Data for Lake Marble Falls near Max Starcke Dam (Segment 26) - Dissolved Oxygen

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

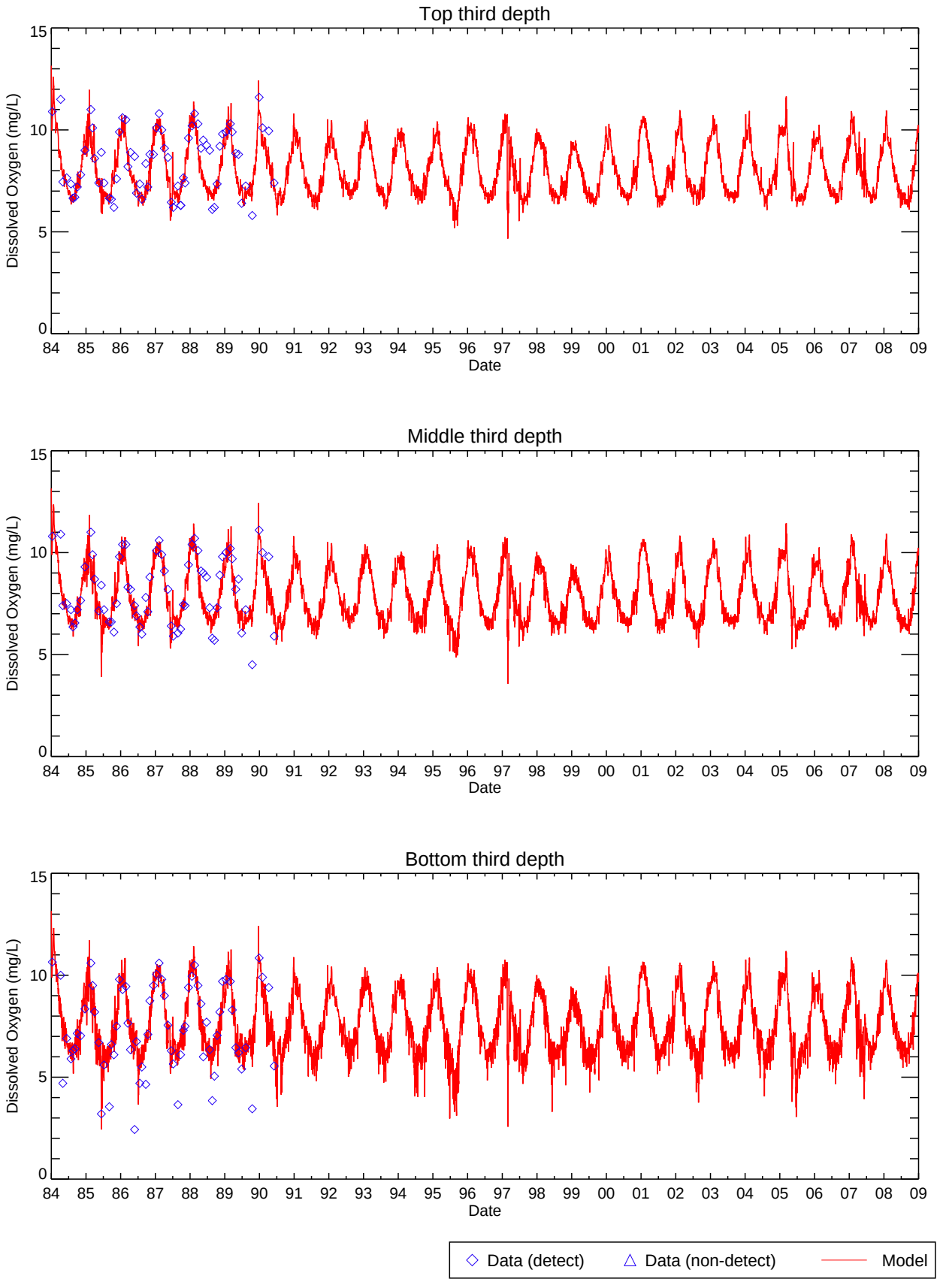


Figure 4-138 Temporal of Model versus Data for Lake Marble Falls near US 281 Bridge (Segment 20) - Dissolved Oxygen

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

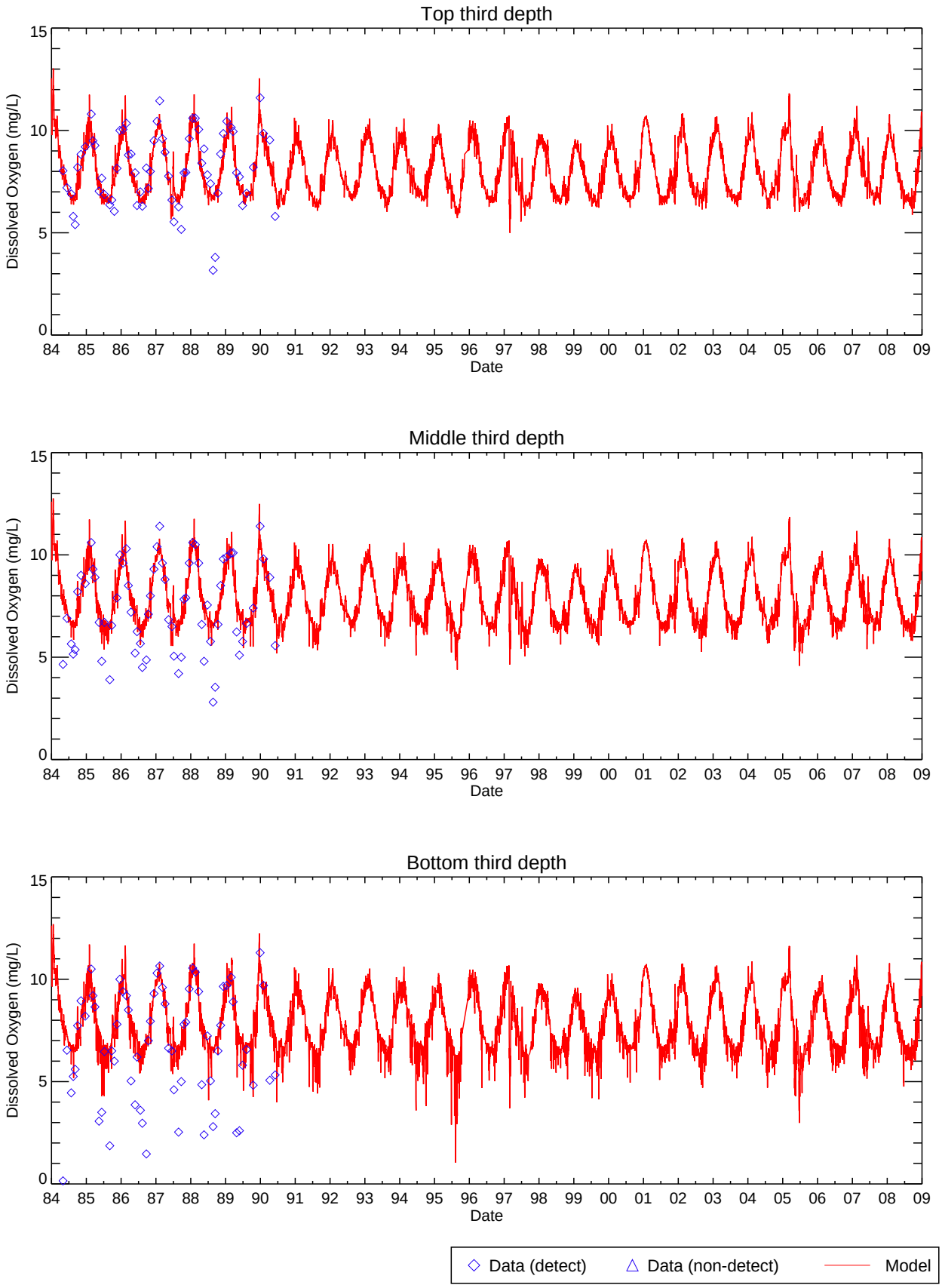


Figure 4-139 Temporal of Model versus Data for Lake Marble Falls at Hefner Ranch (Segment 11) - Dissolved Oxygen

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

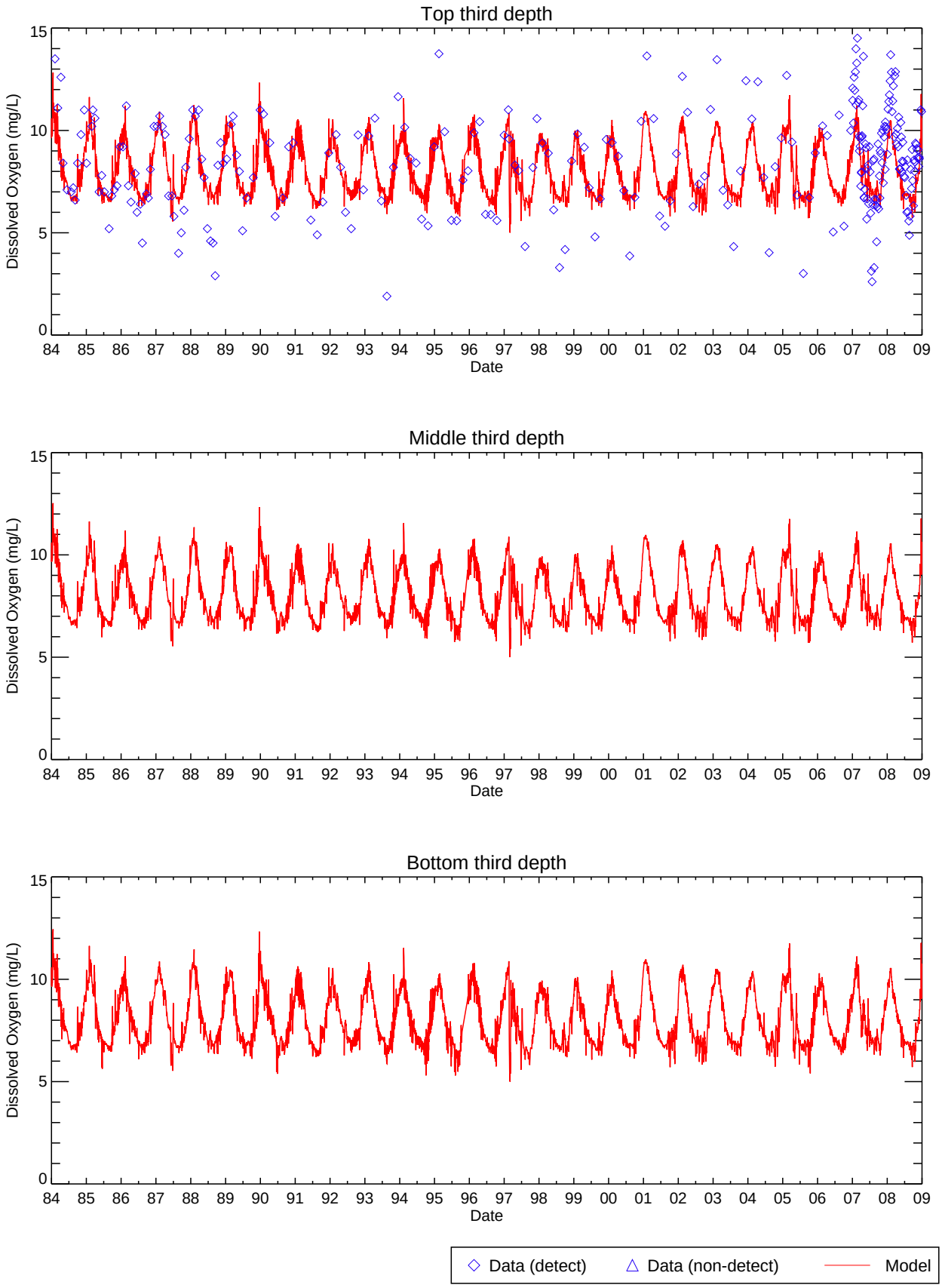


Figure 4-140 Temporal of Model versus Data for Lake Marble Falls at Headwaters (Segment 2) - Dissolved Oxygen

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

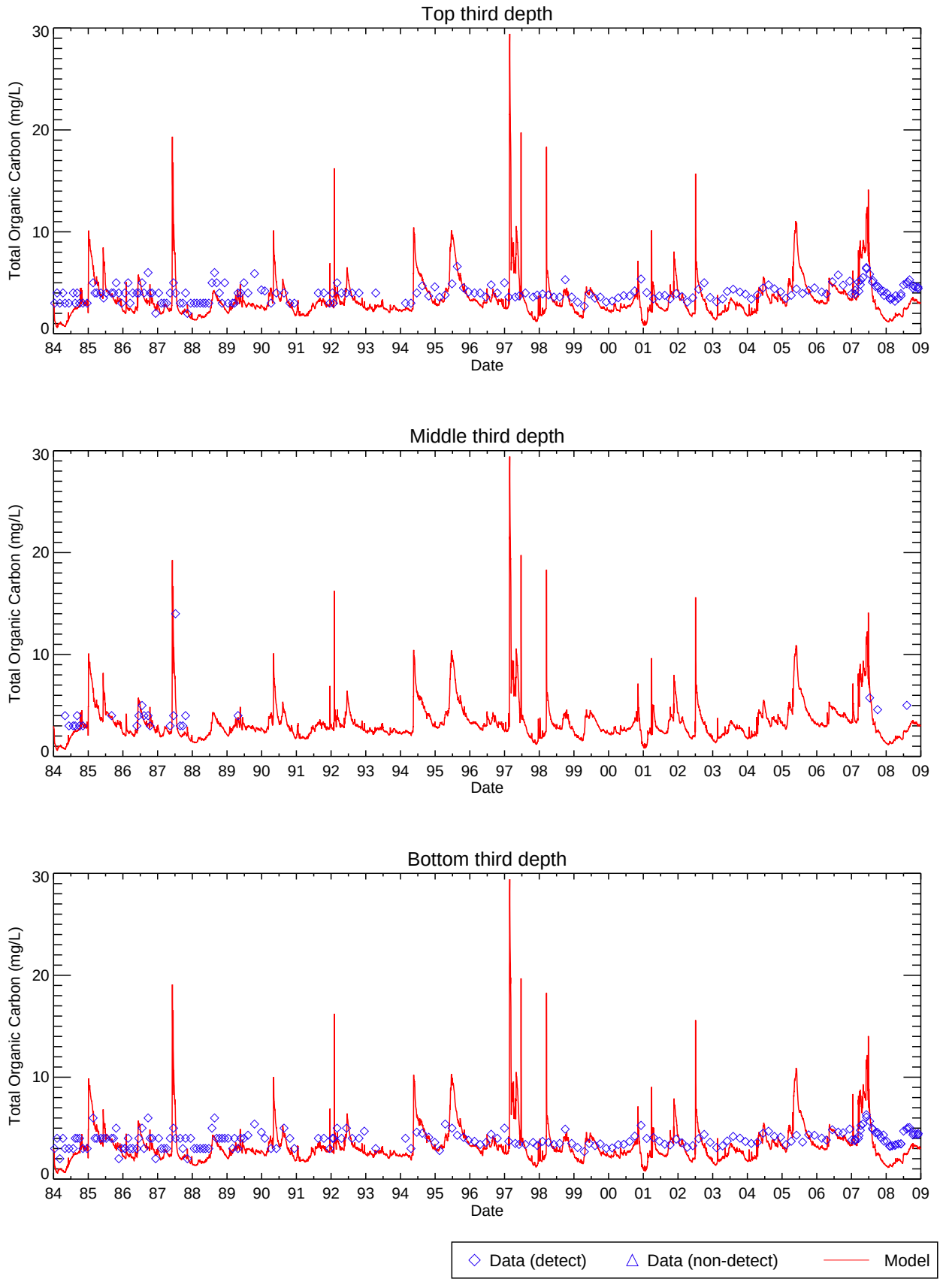


Figure 4-141 Temporal of Model versus Data for Lake Marble Falls near Max Starcke Dam (Segment 26) - Total Organic Carbon

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

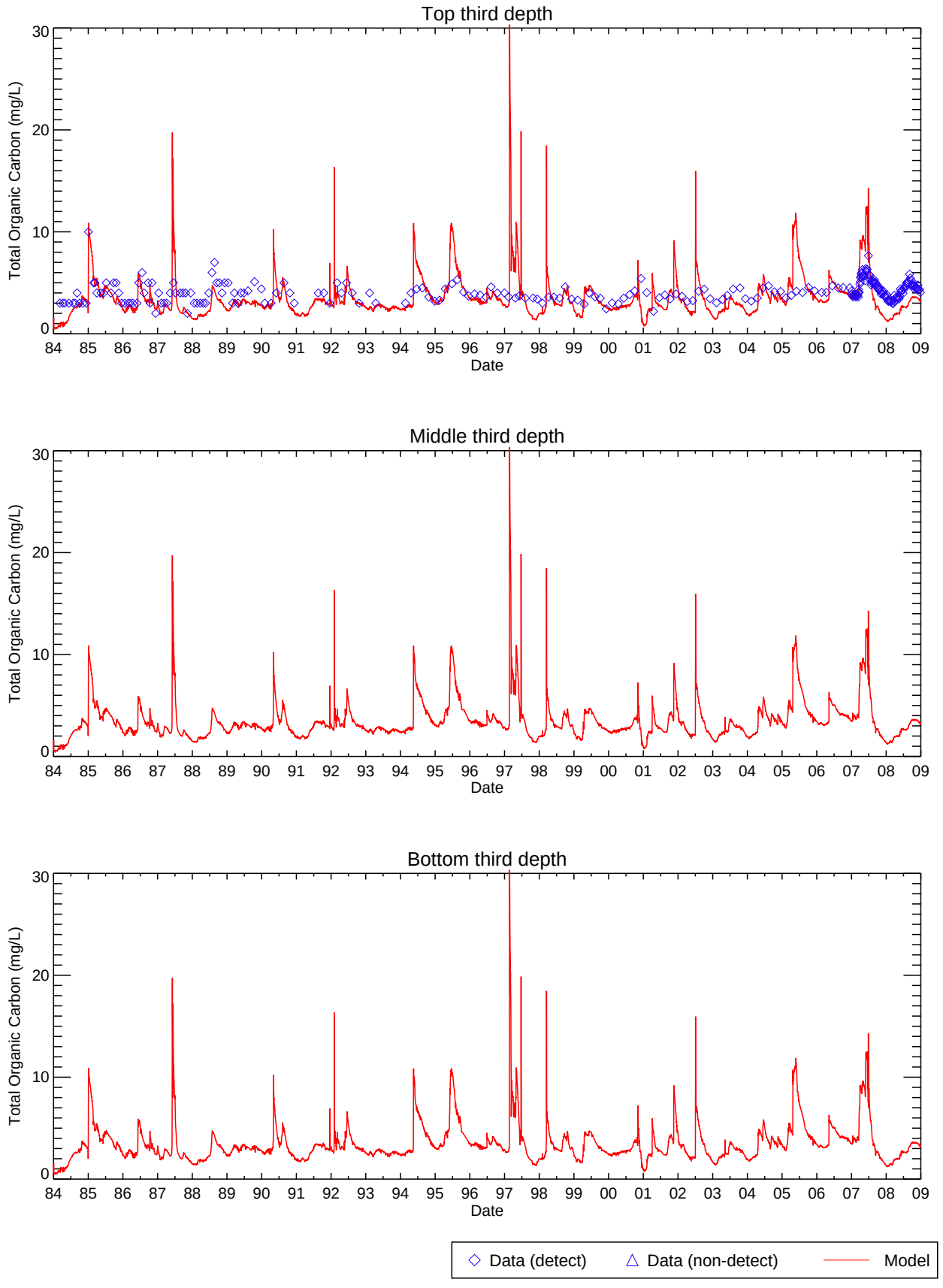


Figure 4-142 Temporal of Model versus Data for Lake Marble Falls at Headwaters (Segment 2) - Total Organic Carbon

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

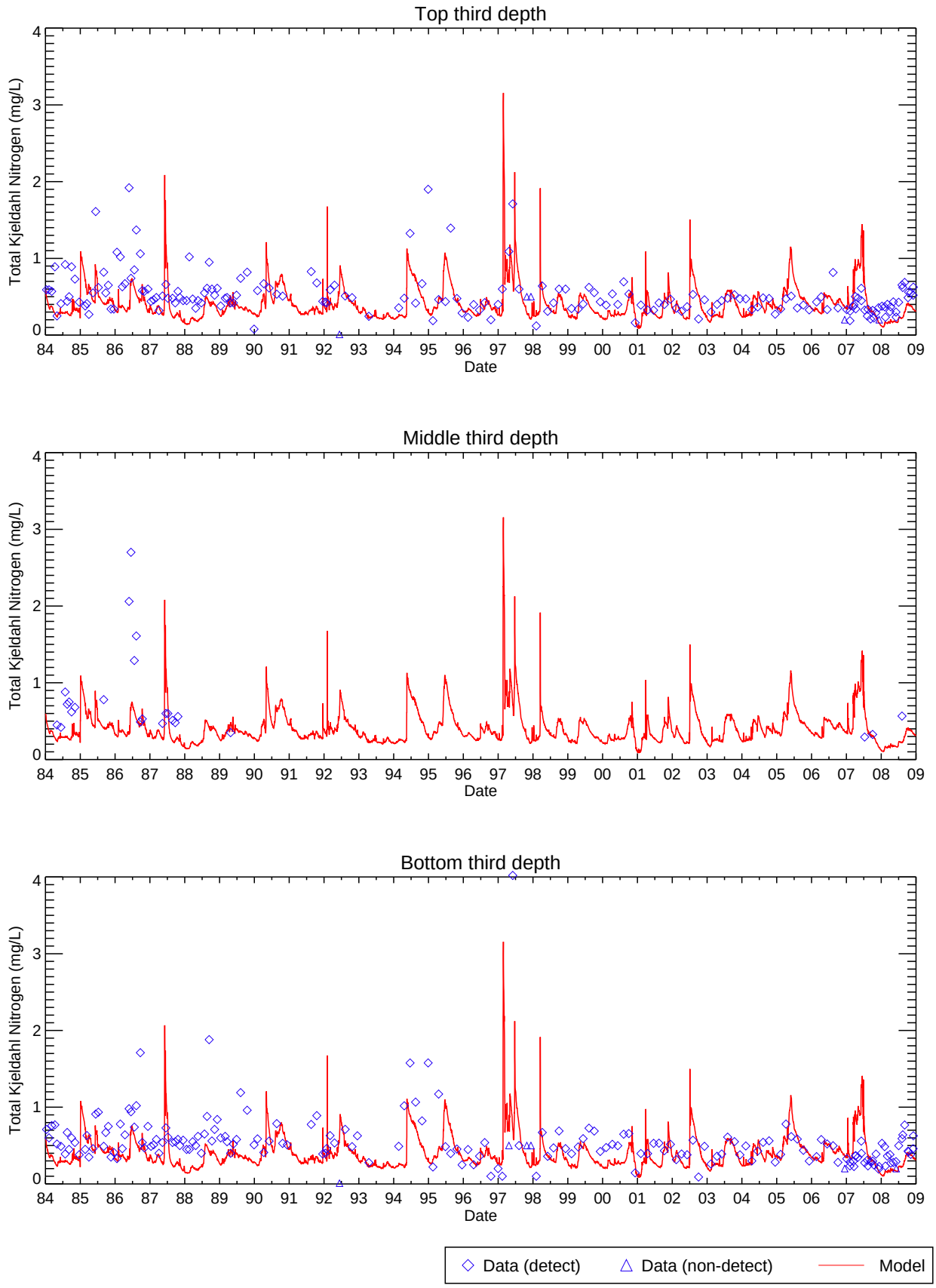


Figure 4-143 Temporal of Model versus Data for Lake Marble Falls near Max Starcke Dam (Segment 26) - Total Kjeldahl Nitrogen

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth

Non-detects plotted at detection limit

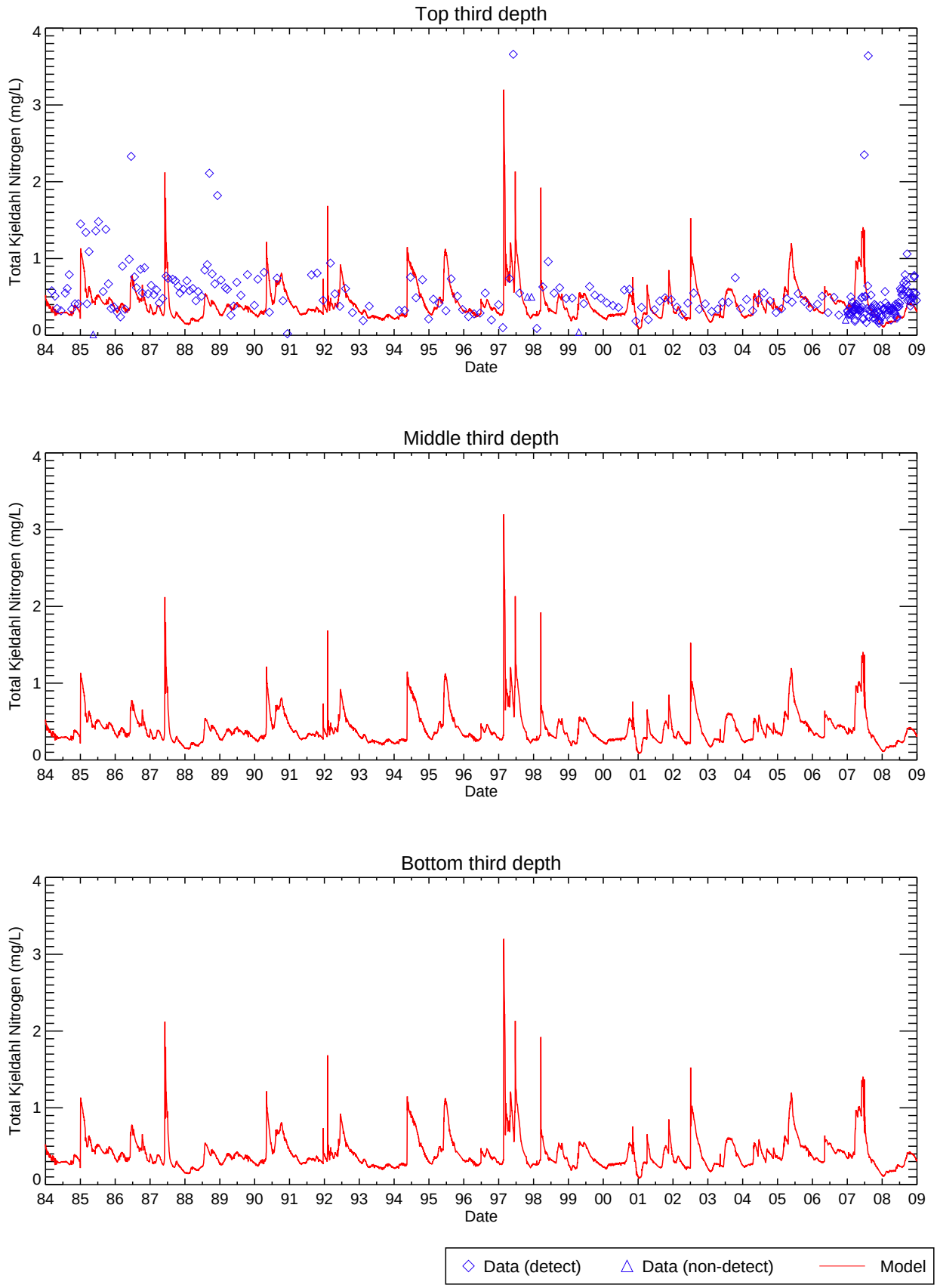


Figure 4-144 Temporal of Model versus Data for Lake Marble Falls at Headwaters (Segment 2) - Total Kjeldahl Nitrogen

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth

Non-detects plotted at detection limit

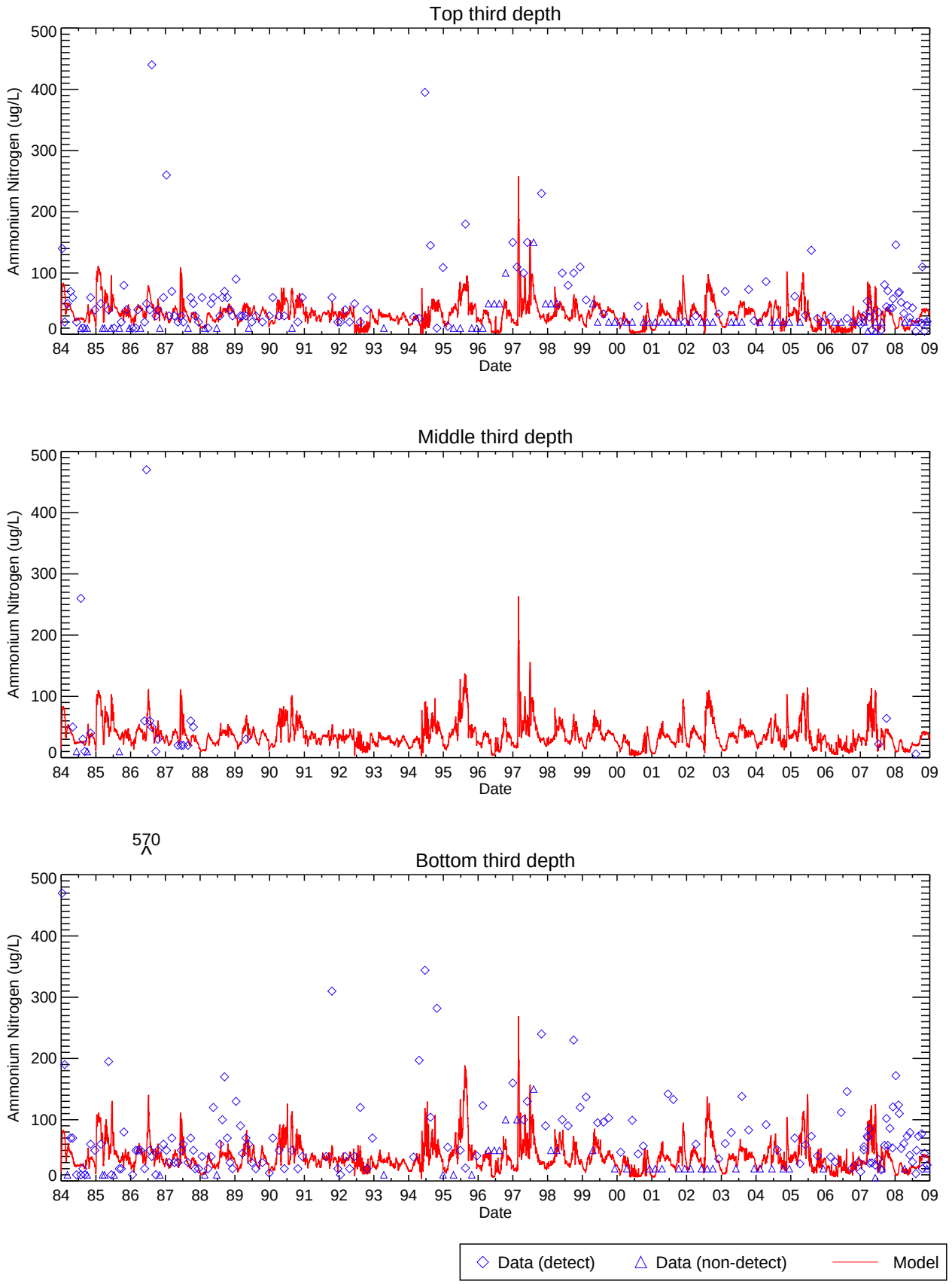


Figure 4-145 Temporal of Model versus Data for Lake Marble Falls near Max Starcke Dam (Segment 26) - Ammonium Nitrogen

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth

Non-detects plotted at detection limit

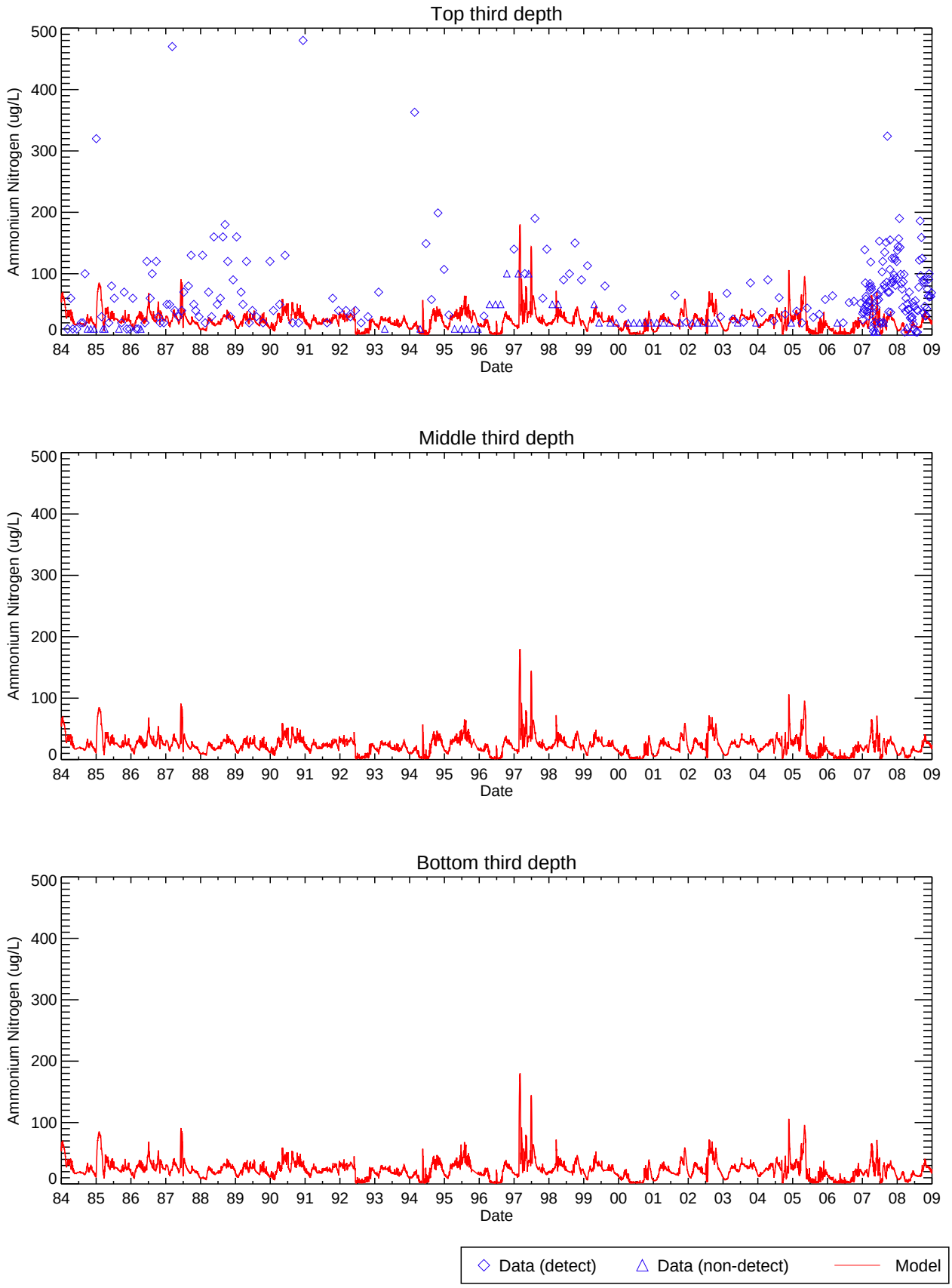


Figure 4-146 Temporal of Model versus Data for Lake Marble Falls at Headwaters (Segment 2) - Ammonium Nitrogen

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth

Non-detects plotted at detection limit

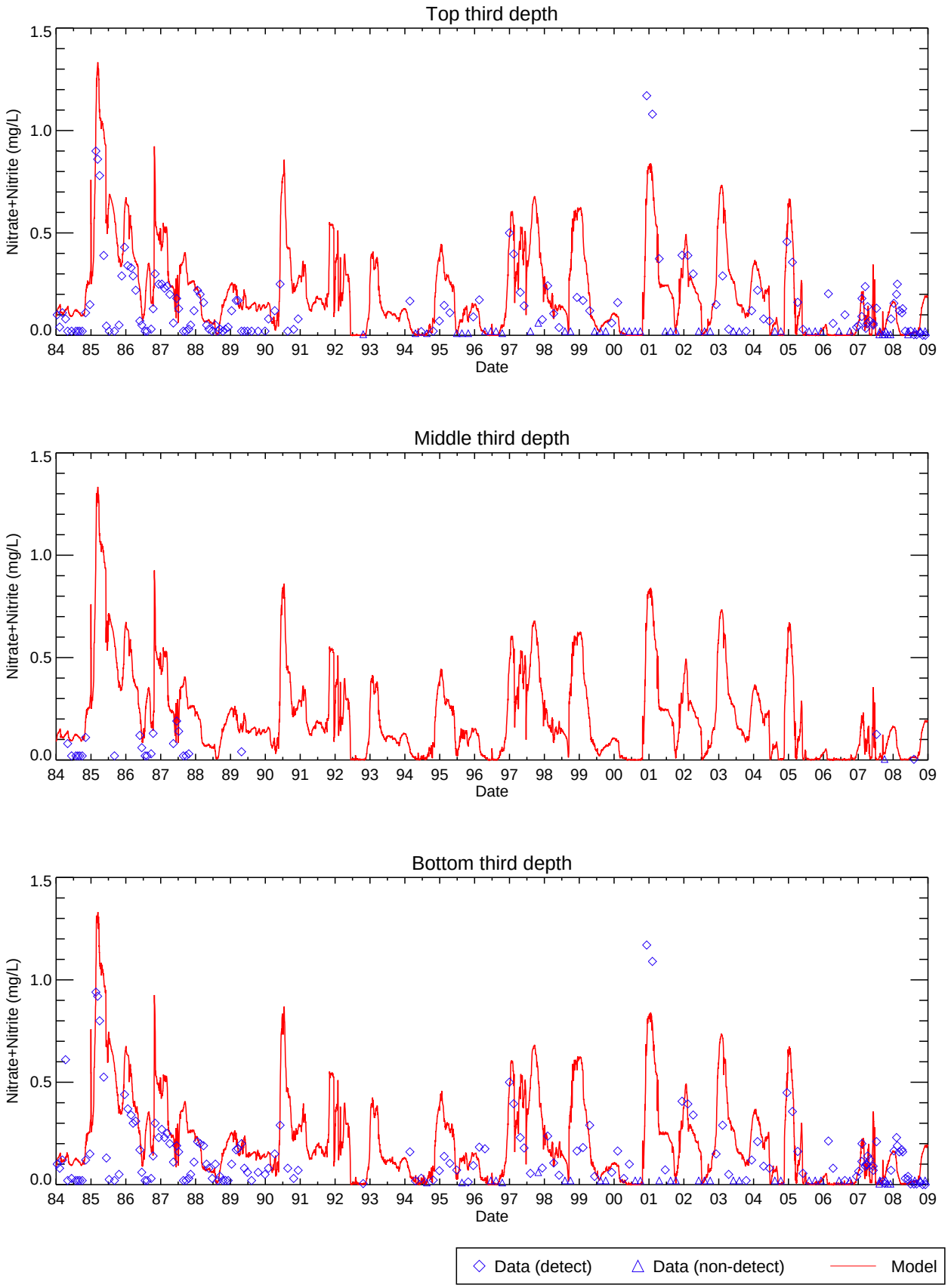


Figure 4-147 Temporal of Model versus Data for Lake Marble Falls near Max Starcke Dam (Segment 26) - Nitrate+Nitrite

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth

Non-detects plotted at detection limit

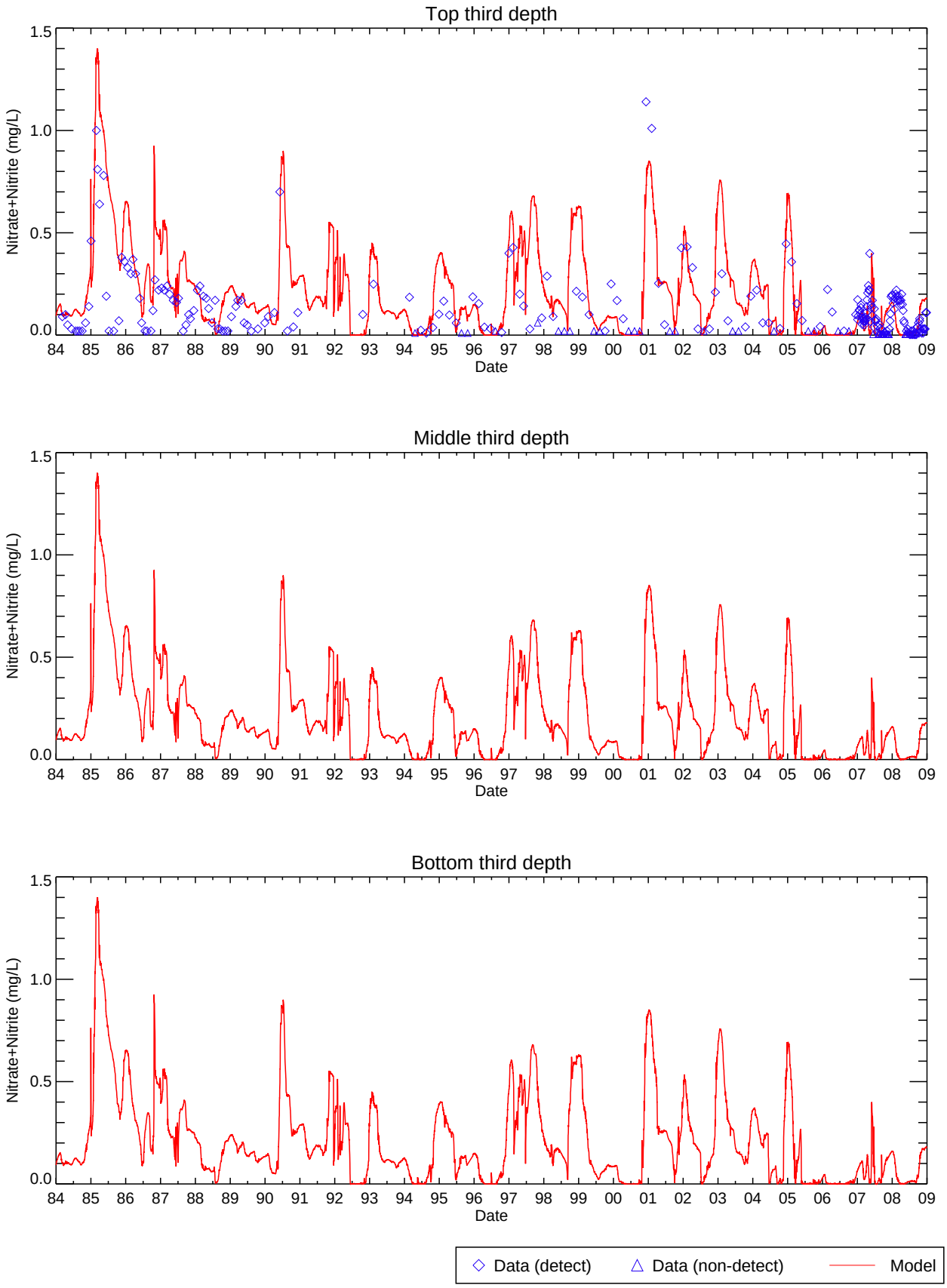


Figure 4-148 Temporal of Model versus Data for Lake Marble Falls at Headwaters (Segment 2) - Nitrate+Nitrite

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth

Non-detects plotted at detection limit

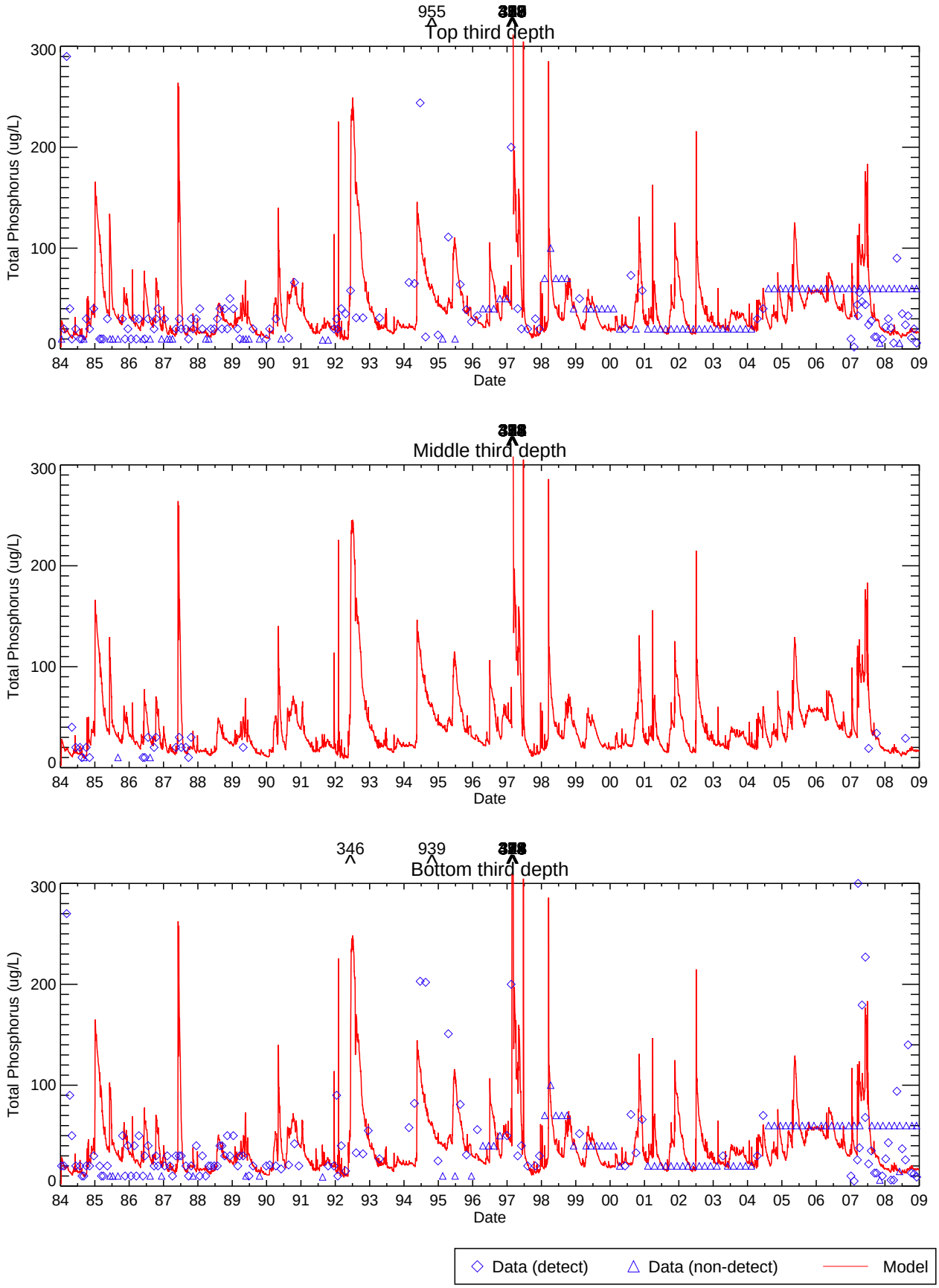


Figure 4-149 Temporal of Model versus Data for Lake Marble Falls near Max Starcke Dam (Segment 26) - Total Phosphorus

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth

Non-detects plotted at detection limit

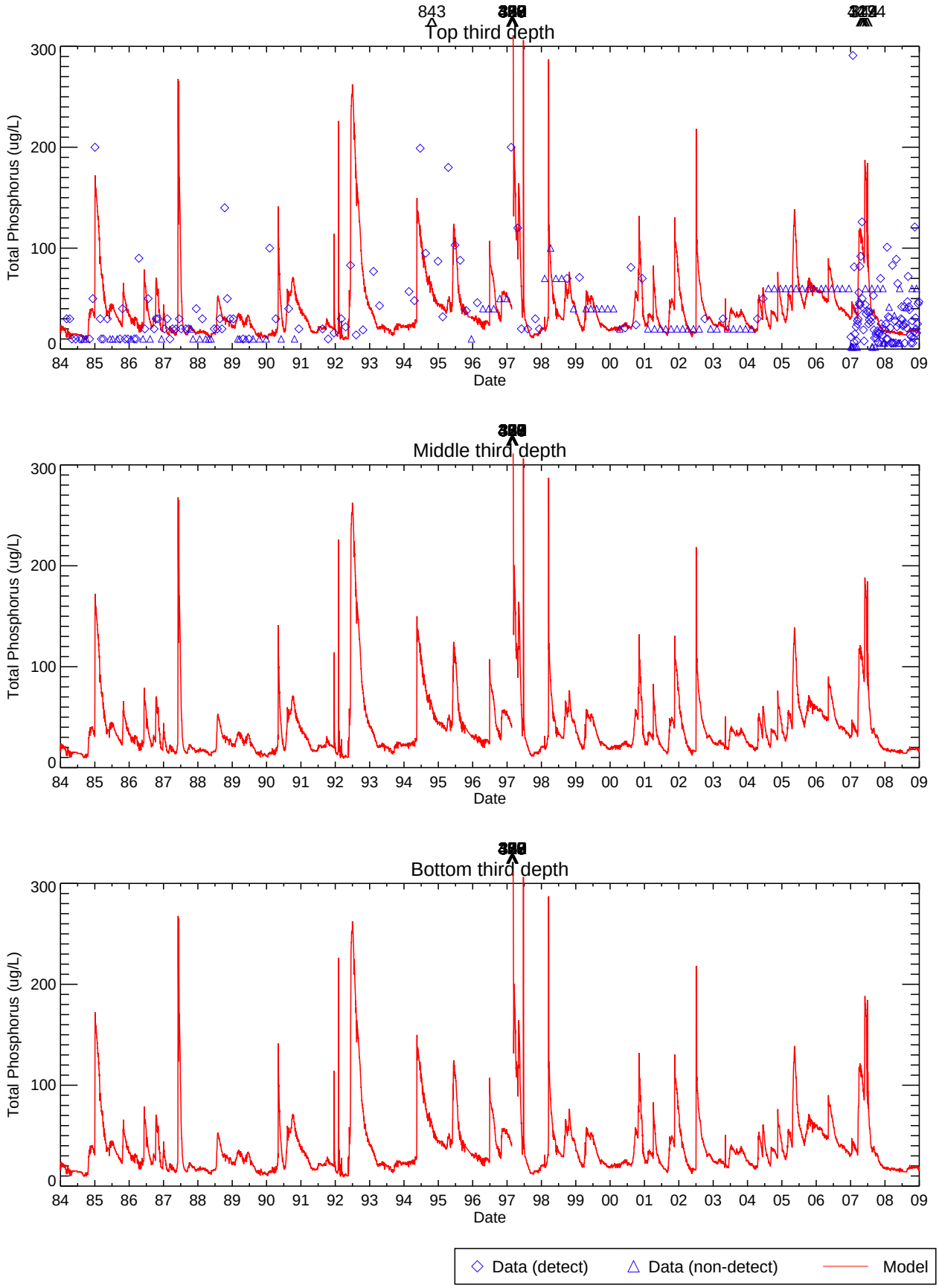


Figure 4-150 Temporal of Model versus Data for Lake Marble Falls at Headwaters (Segment 2) - Total Phosphorus

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth

Non-detects plotted at detection limit

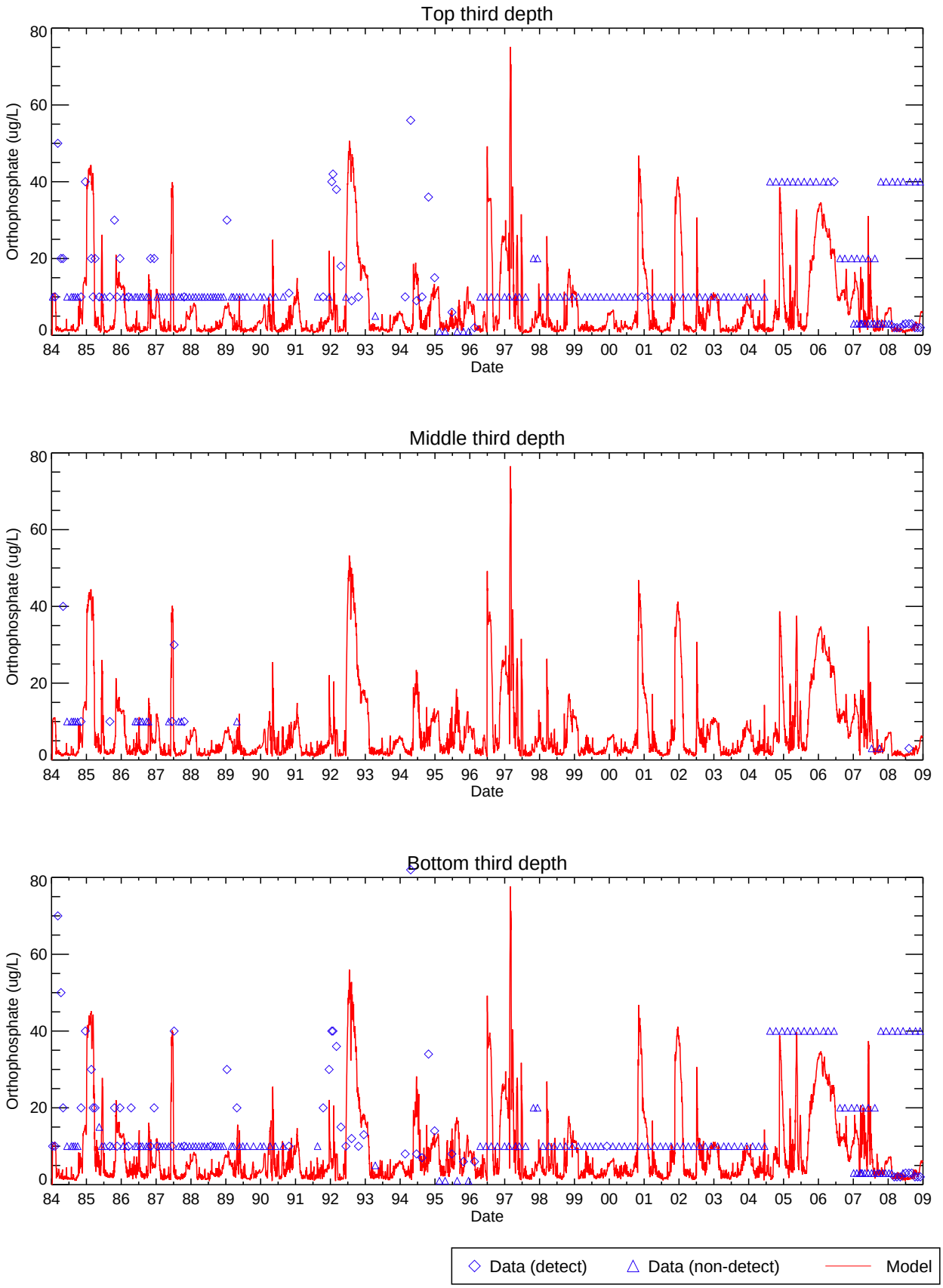


Figure 4-151 Temporal of Model versus Data for Lake Marble Falls near Max Starcke Dam (Segment 26) - Orthophosphate

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth

Non-detects plotted at detection limit

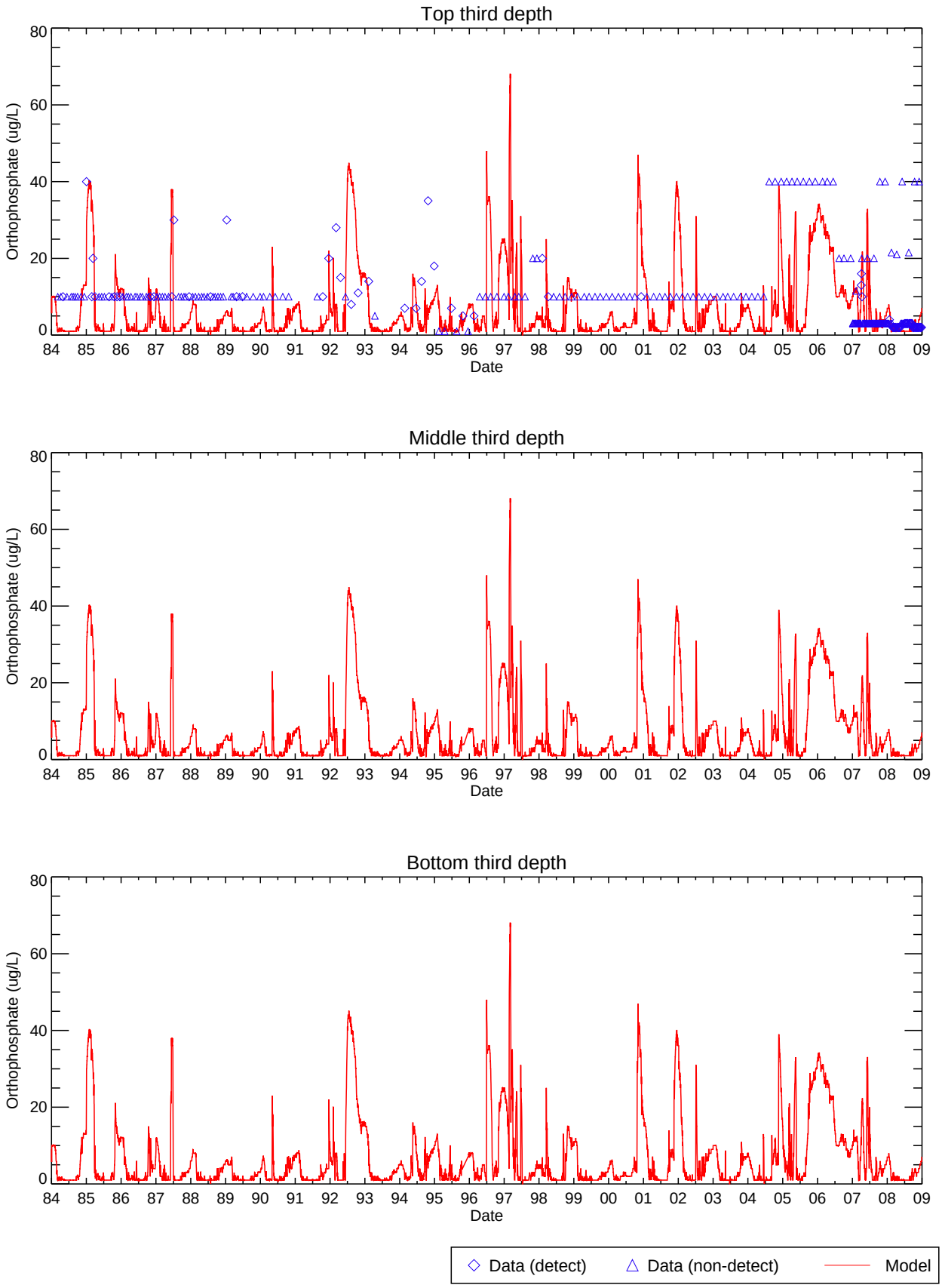


Figure 4-152 Temporal of Model versus Data for Lake Marble Falls at Headwaters (Segment 2) - Orthophosphate

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth

Non-detects plotted at detection limit

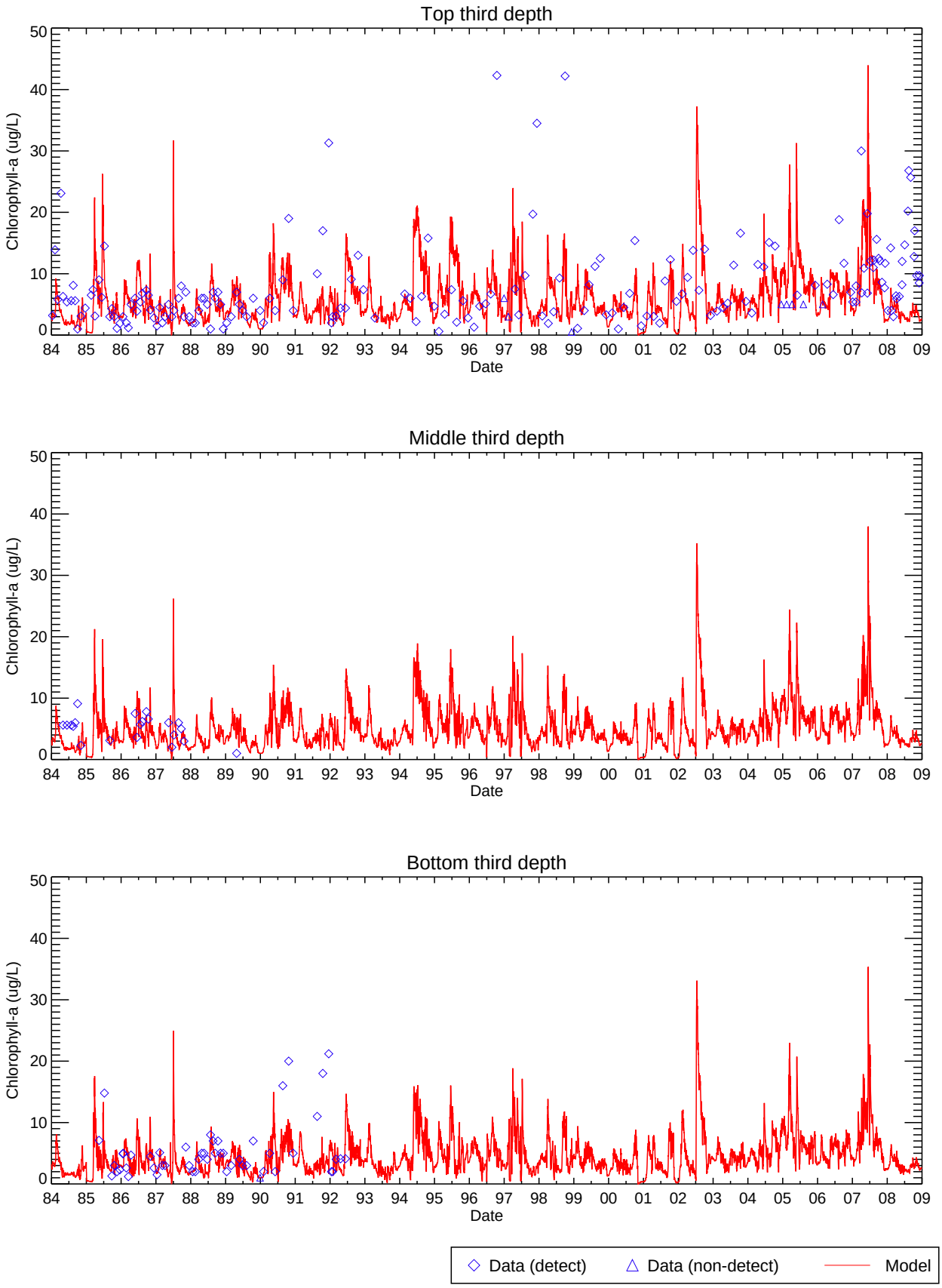


Figure 4-153 Temporal of Model versus Data for Lake Marble Falls near Max Starcke Dam (Segment 26) - Chlorophyll-a

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth

Non-detects plotted at detection limit

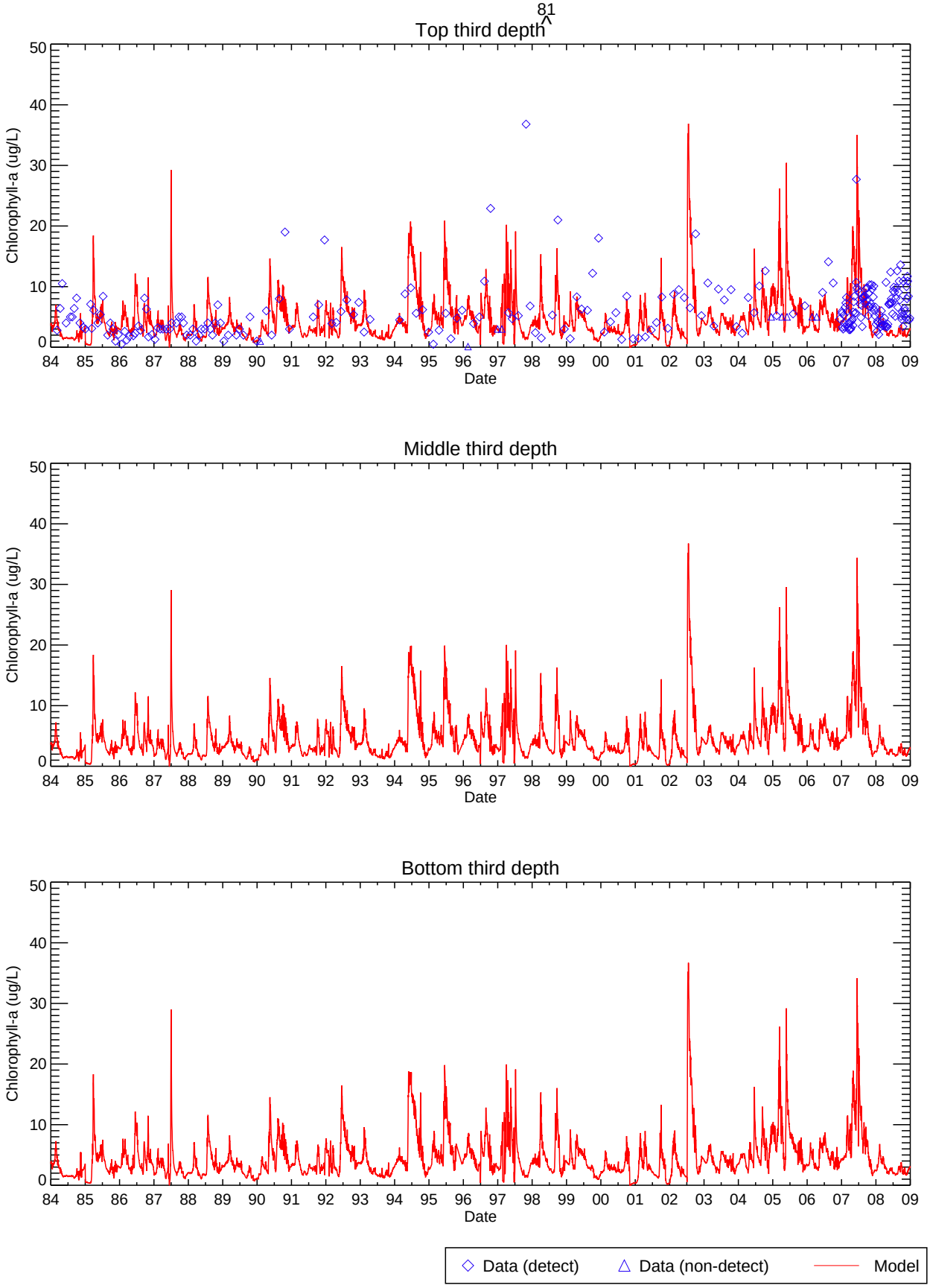


Figure 4-154 Temporal of Model versus Data for Lake Marble Falls at Headwaters (Segment 2) - Chlorophyll-a

Model depth at this location was used to divide water column into thirds; if data were collected below maximum model depth, data were divided based on maximum data depth

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth

Non-detects plotted at detection limit

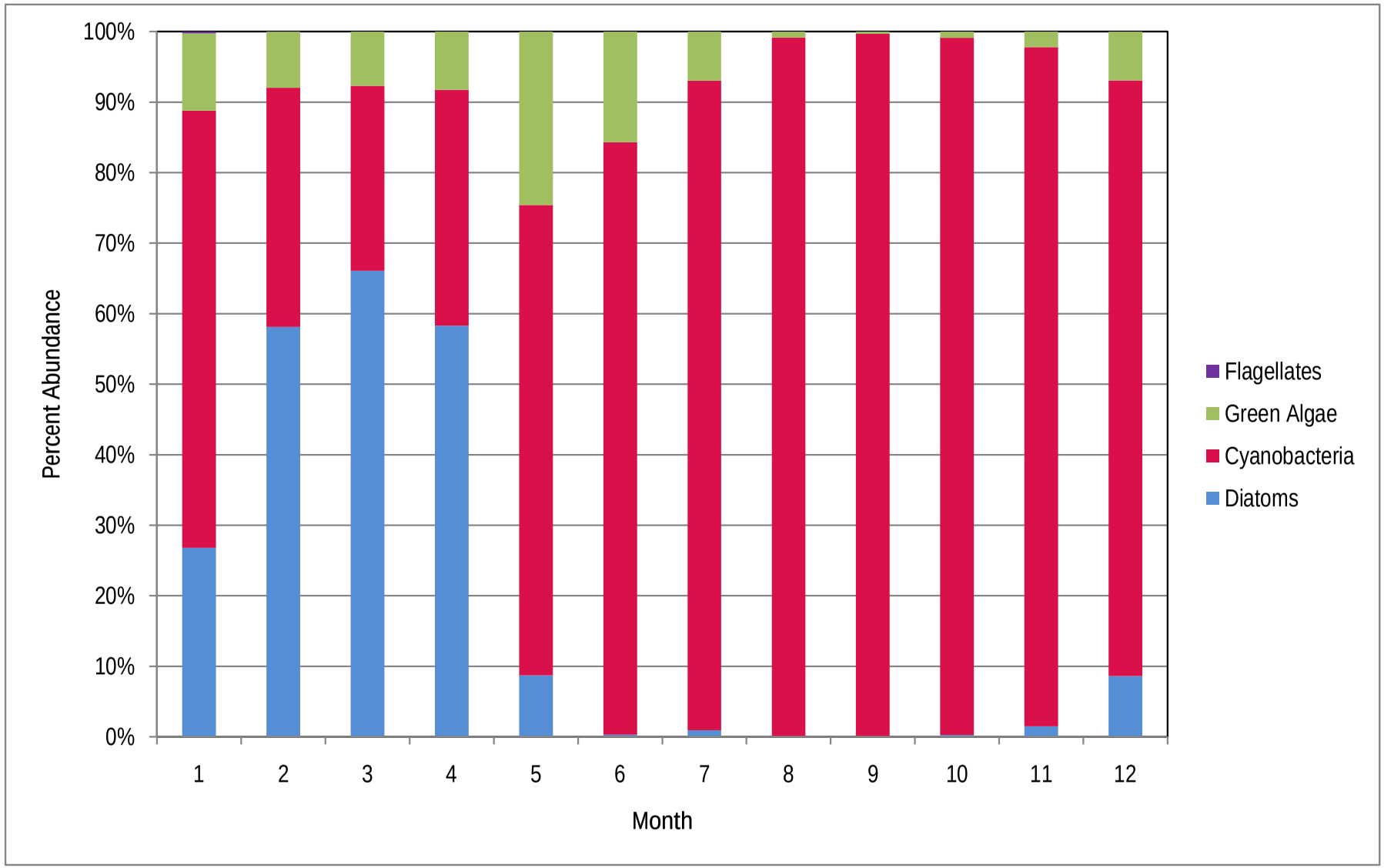


Figure 4-155 Predicted Seasonal Abundances of Major Algal Groups in Lake Marble Falls near Max Starcke Dam

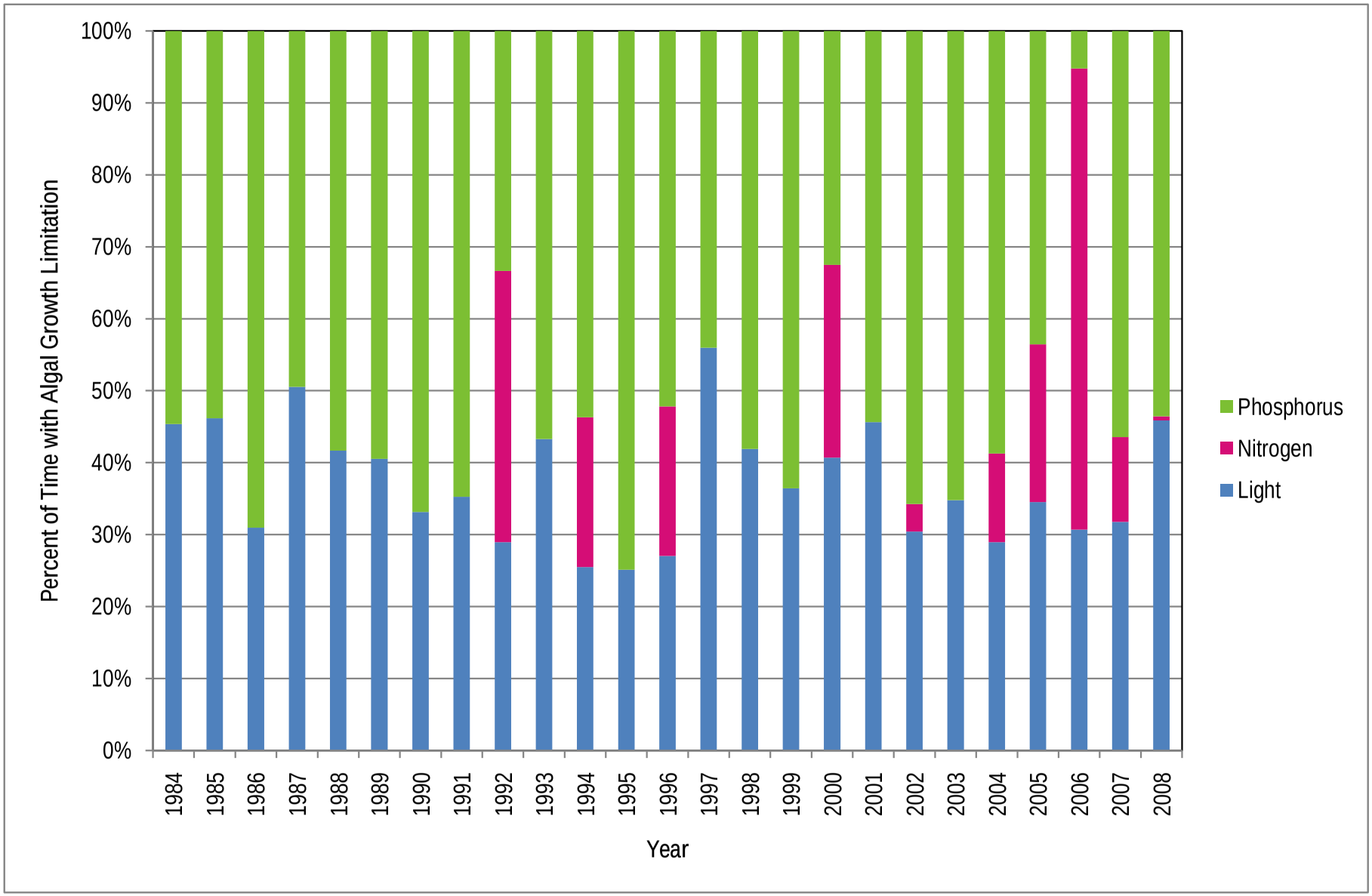


Figure 4-156 Algal Growth Limiting Factors by Year in Lake Marble Falls near Max Starcke Dam

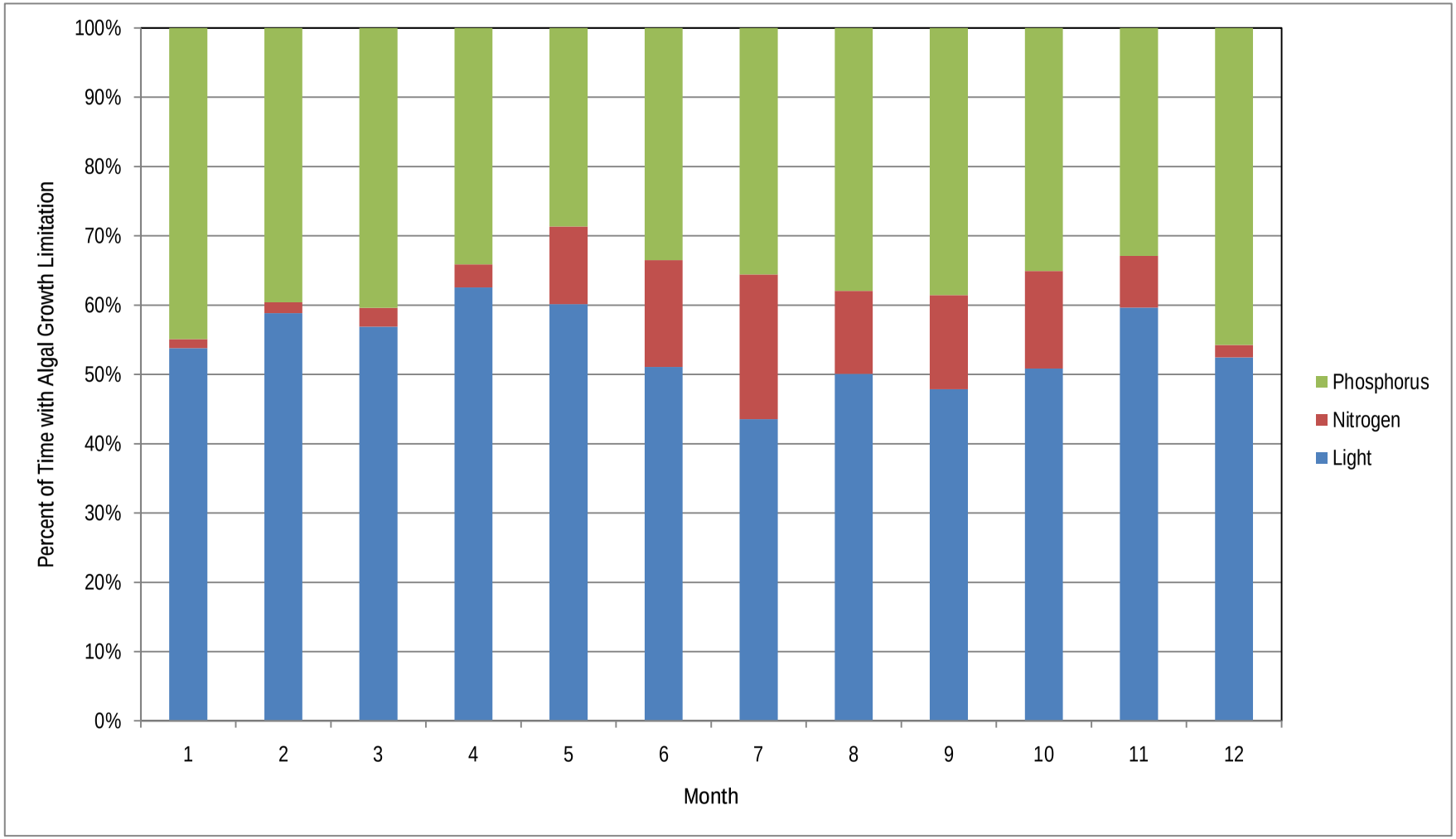
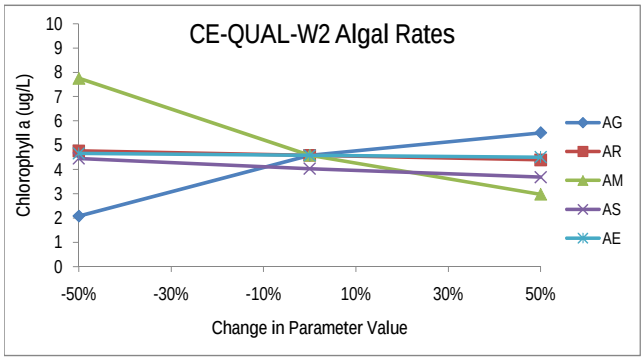
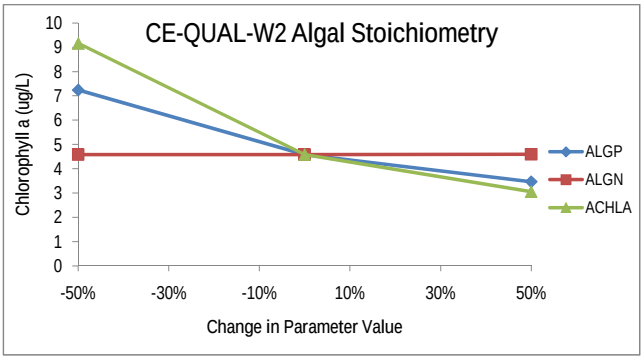
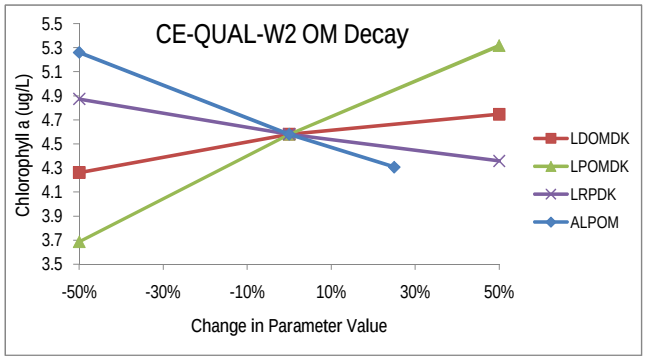
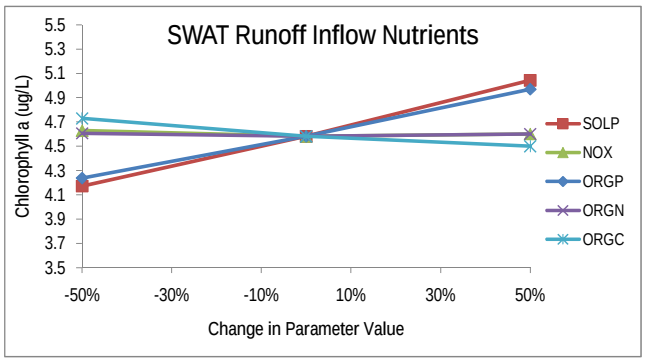


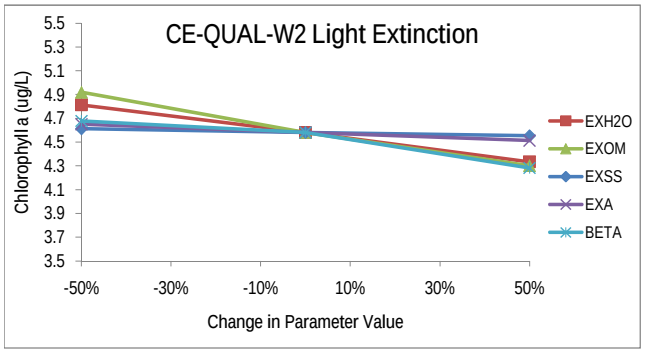
Figure 4-157 Algal Growth Limiting Factors by Month in Lake Marble Falls near Max Starcke Dam

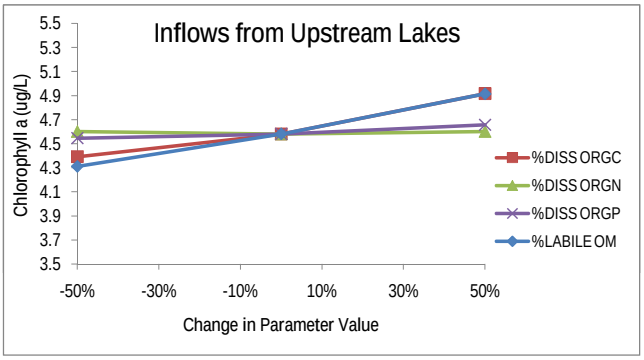


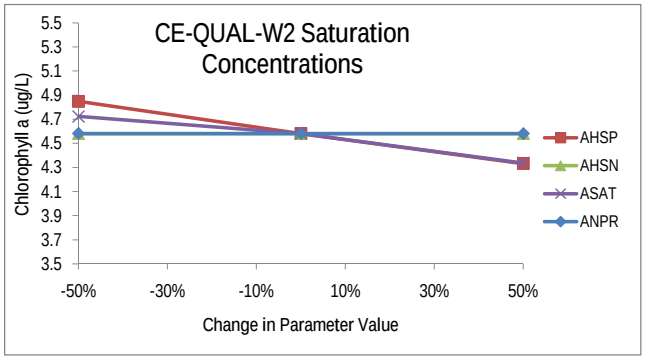












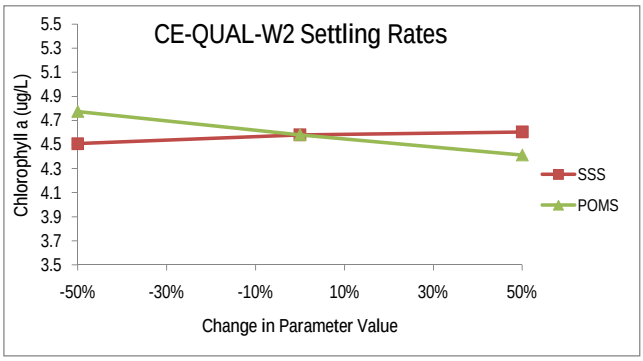
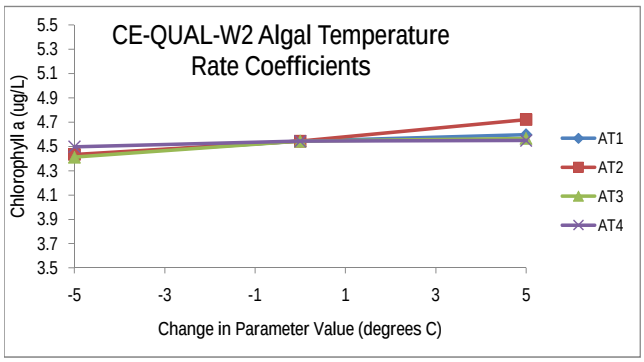
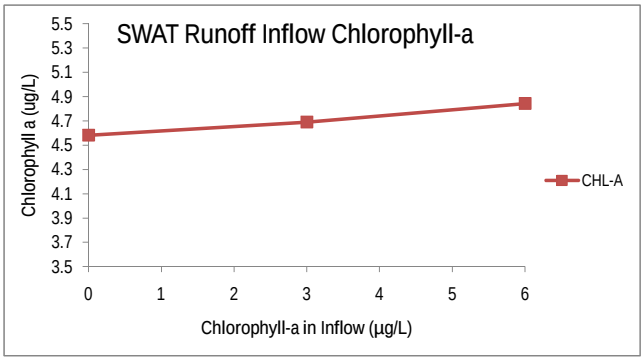
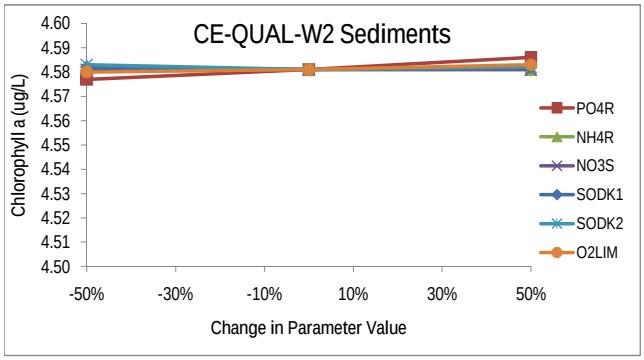
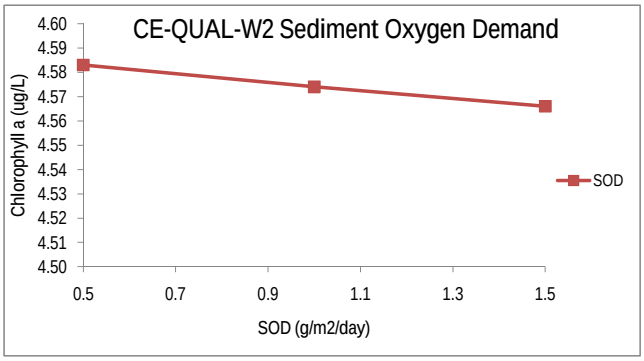


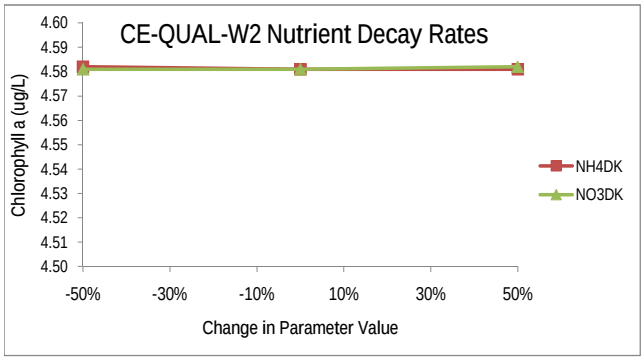
Figure 4-158 Sensitivity of Chlorophyll a Predictions at Lake LBJ near Wirtz Dam











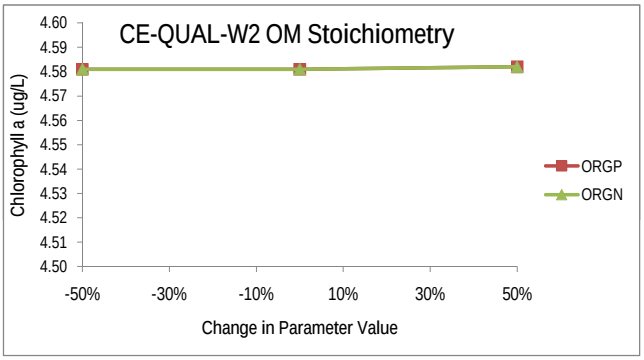


Figure 4-158 Sensitivity of Chlorophyll a Predictions at Lake LBJ near Wirtz Dam - cont'd

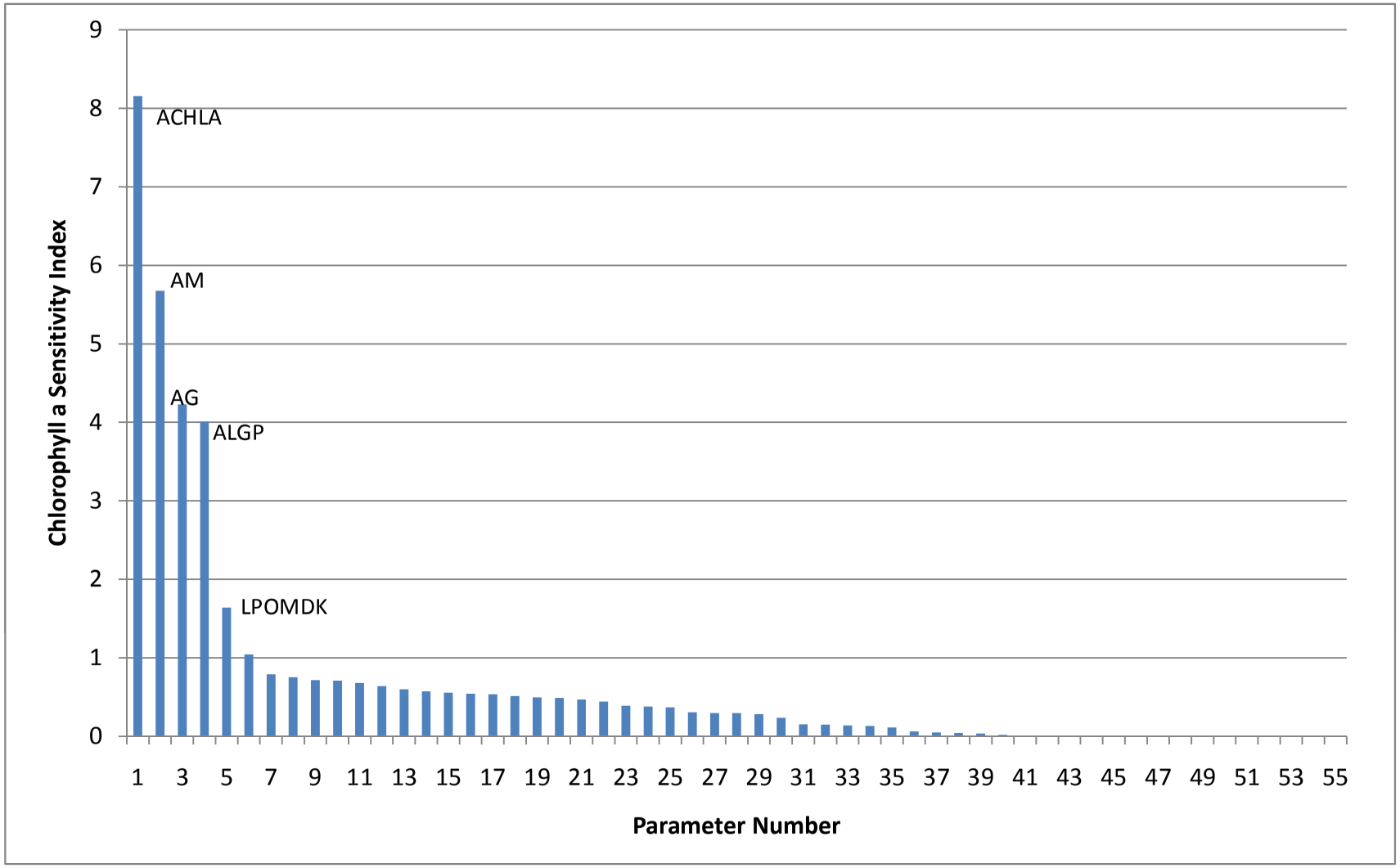


Figure 4-159 Ranking and Scree Plot

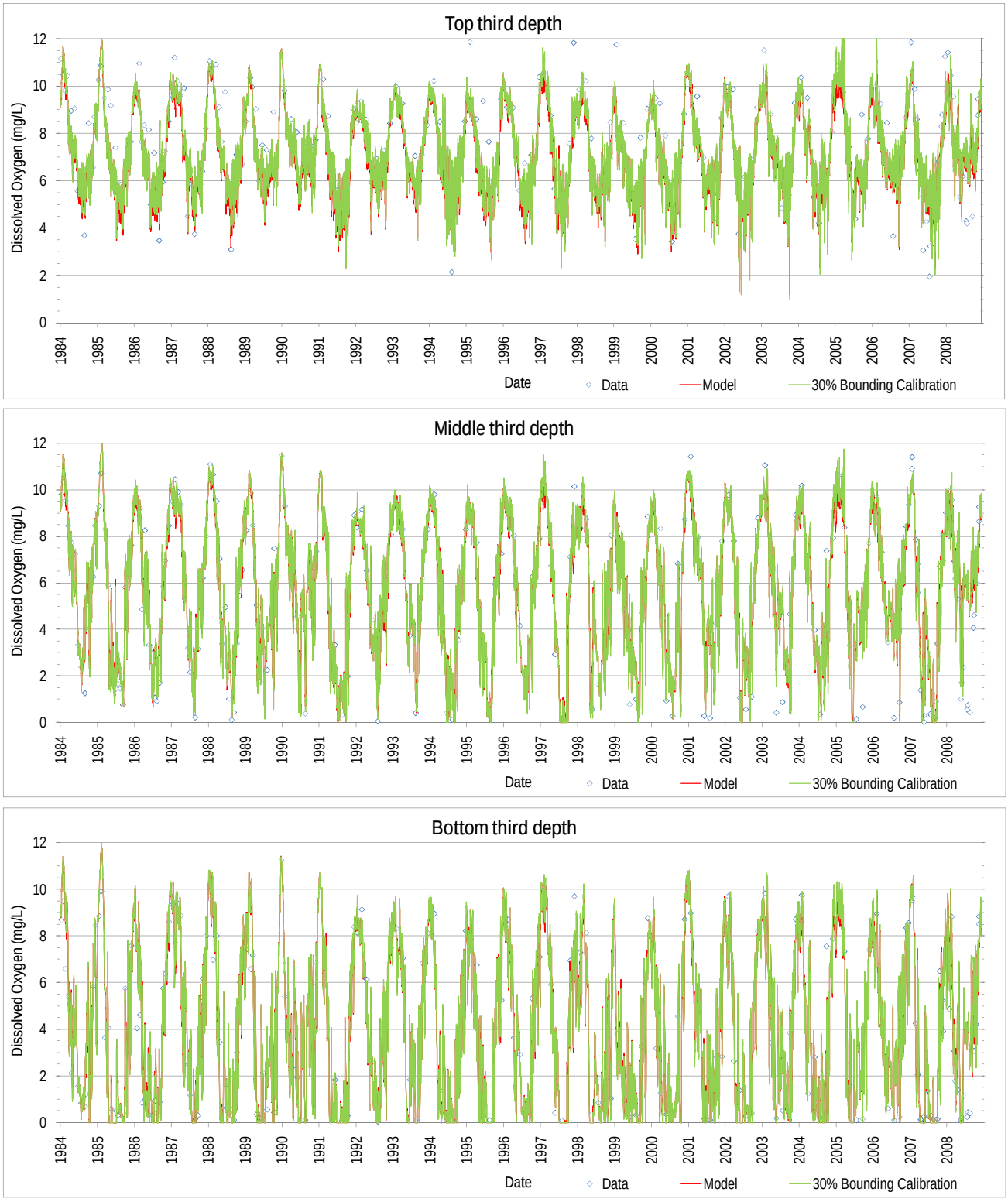


Figure 4-160 Temporal of Model versus Data for Inks Lake at Inks Dam (Segment 15) - Dissolved Oxygen - Bounding Calibration

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

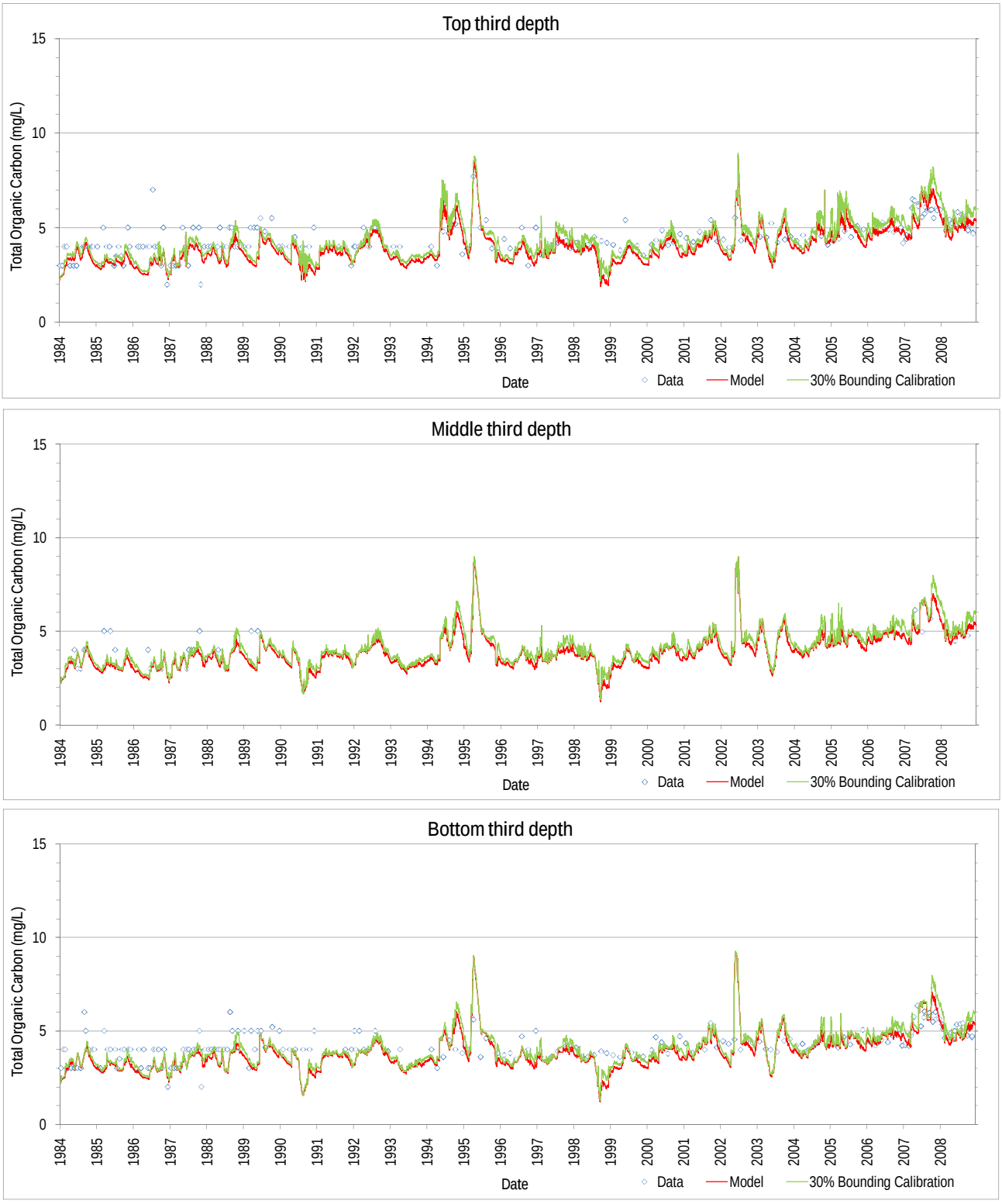


Figure 4-161 Temporal of Model versus Data for Inks Lake at Inks Dam (Segment 15) - Total Organic Carbon - Bounding Calibration

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

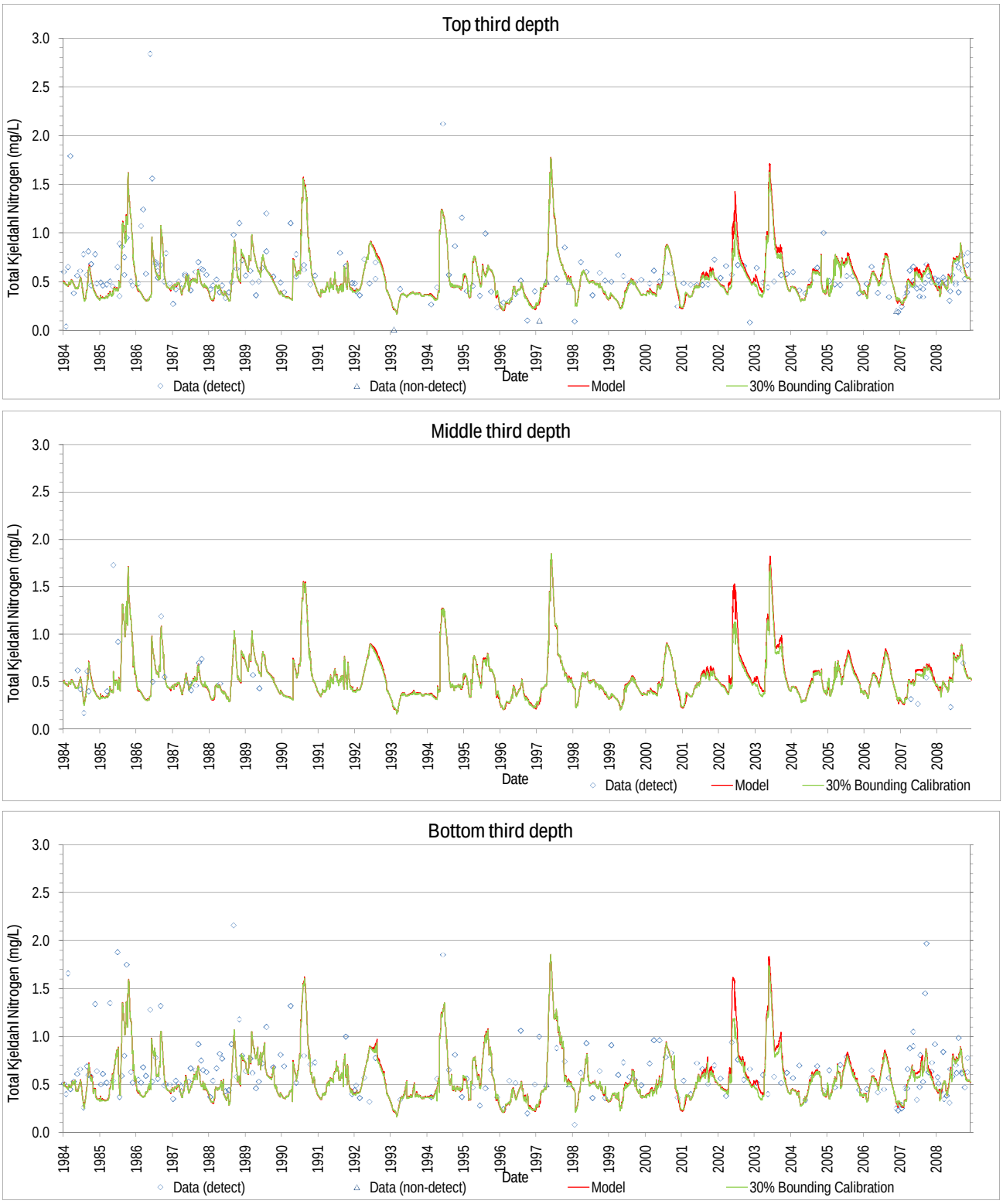


Figure 4-162 Temporal of Model versus Data for Inks Lake at Inks Dam (Segment 15) - Total Kjeldahl Nitrogen - Bounding Calibration

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

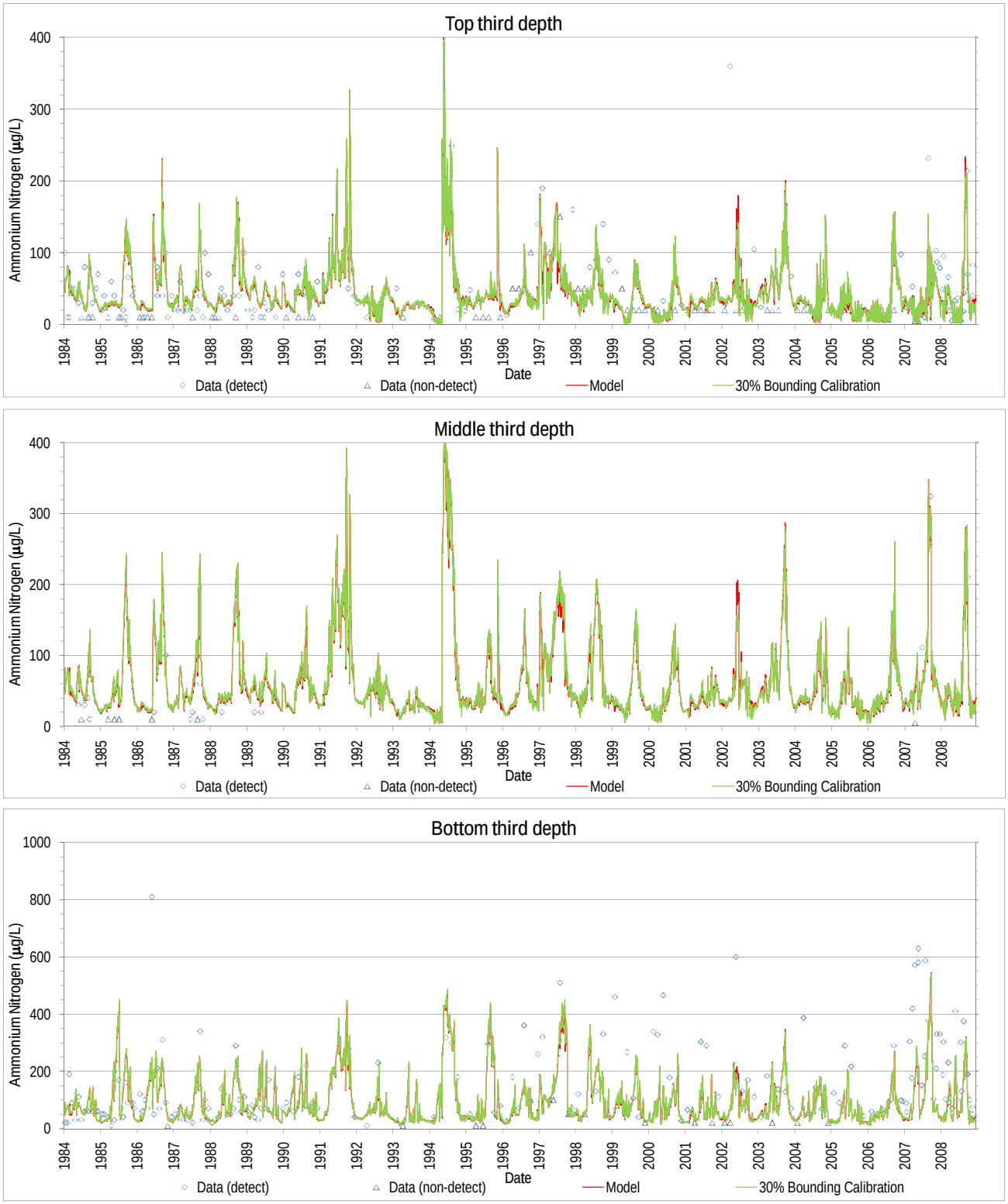


Figure 4-163 Temporal of Model versus Data for Inks Lake at Inks Dam (Segment 15) - Ammonium Nitrogen - Bounding Calibration

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

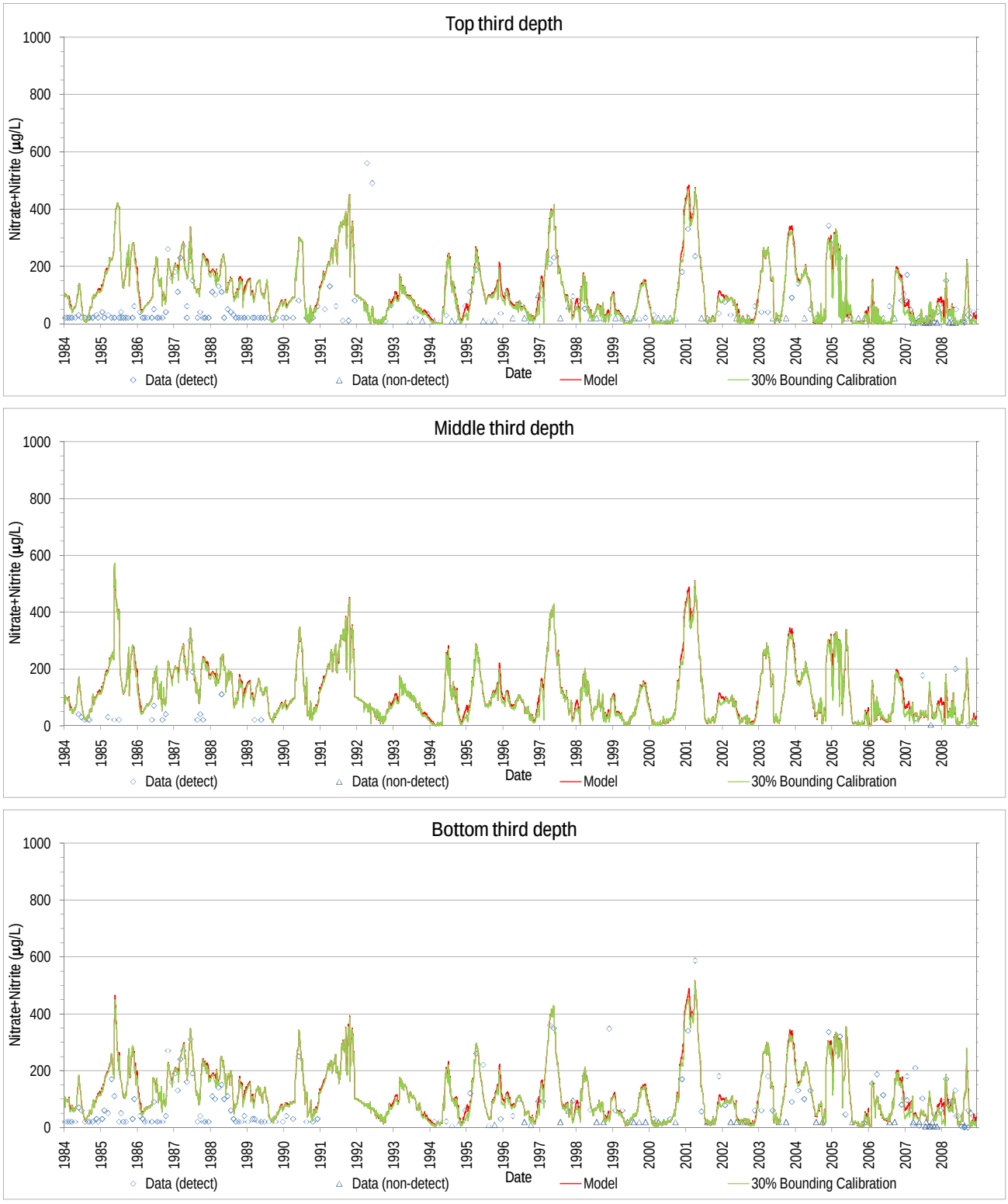


Figure 4-164 Temporal of Model versus Data for Inks Lake at Inks Dam (Segment 15) - Nitrate+Nitrite

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

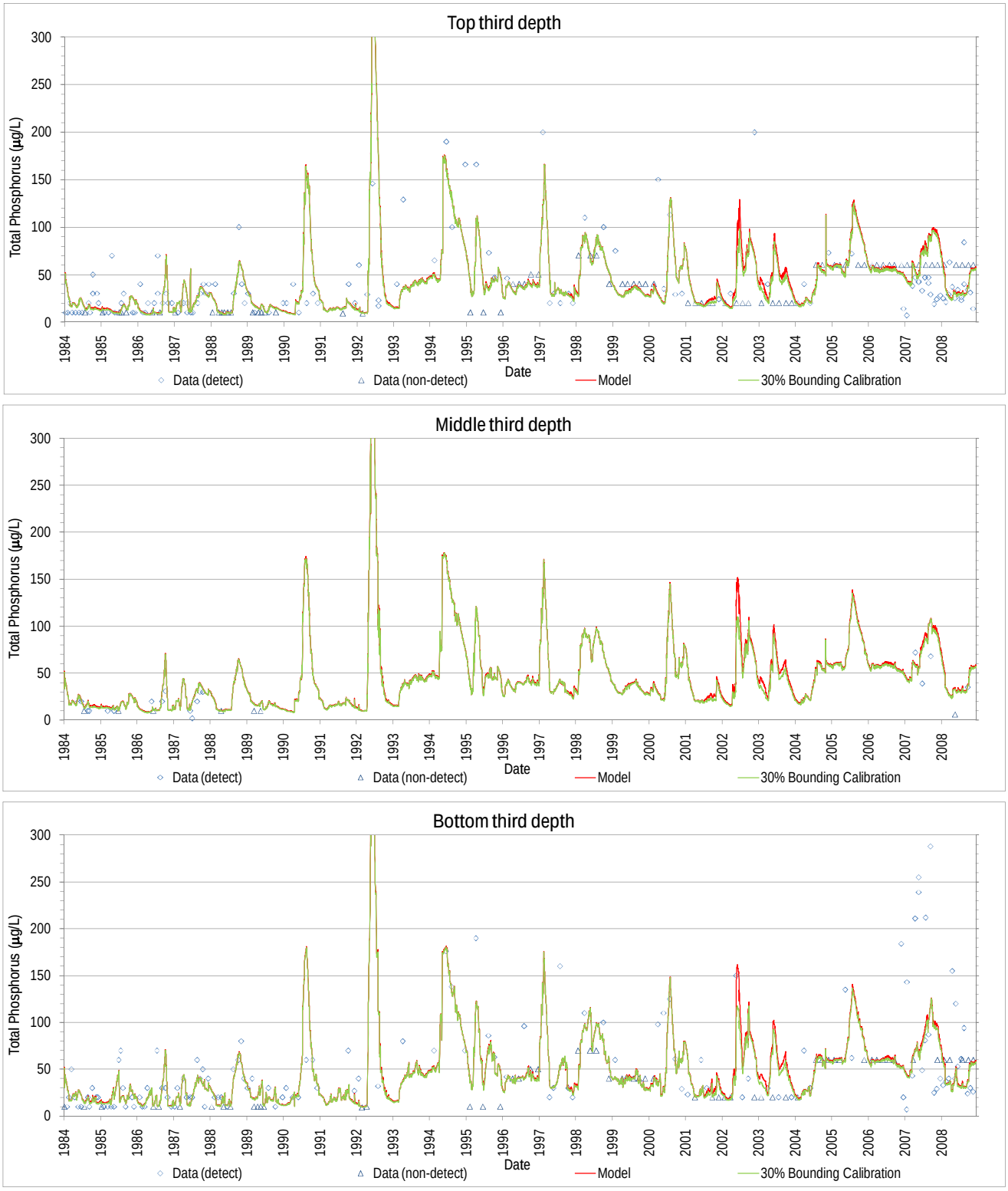
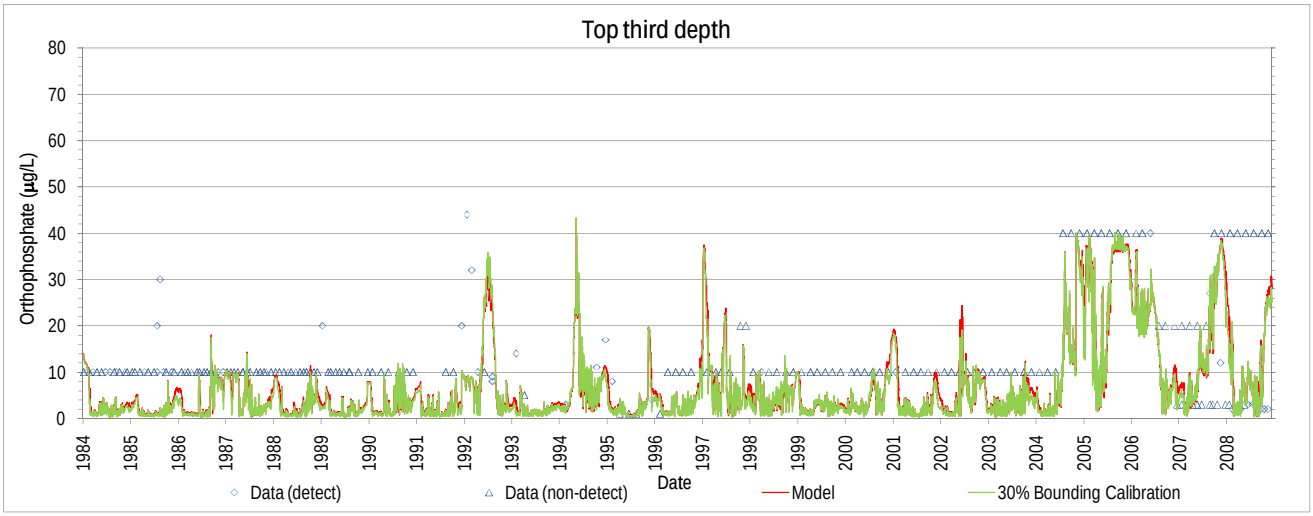


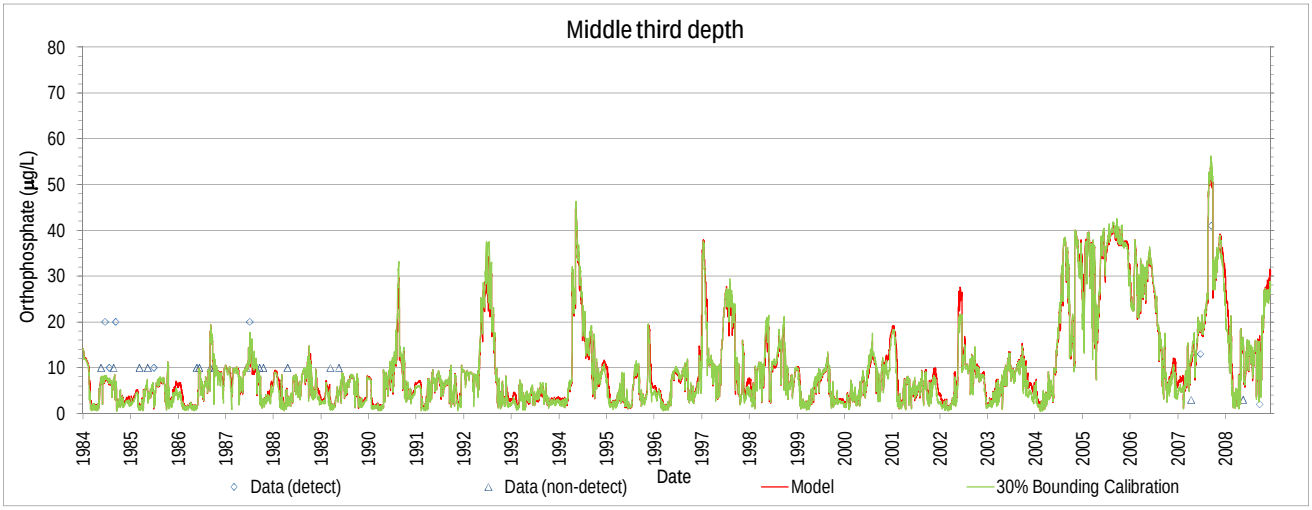
Figure 4-165 Temporal of Model versus Data for Inks Lake at Inks Dam (Segment 15) - Total Phosphorus - Bounding Calibration

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit





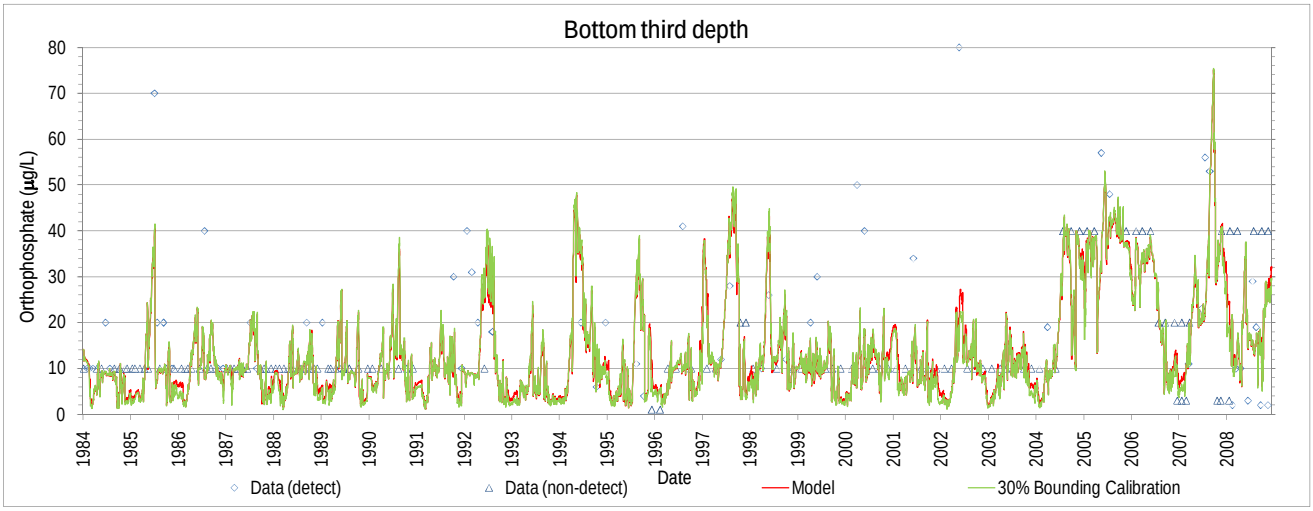


Figure 4-166 Temporal of Model versus Data for Inks Lake at Inks Dam (Segment 15) - Orthophosphate - Bounding Calibration

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

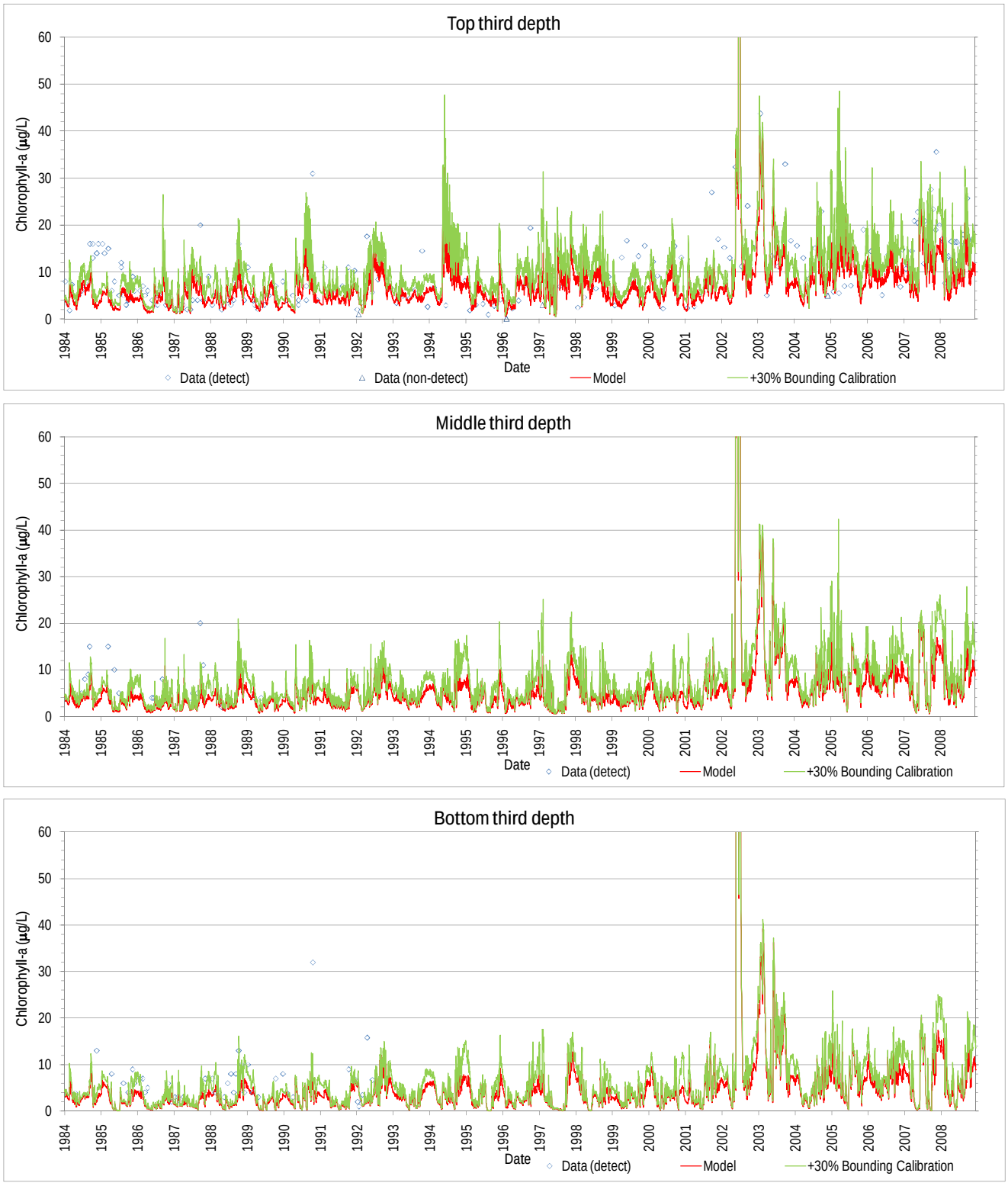
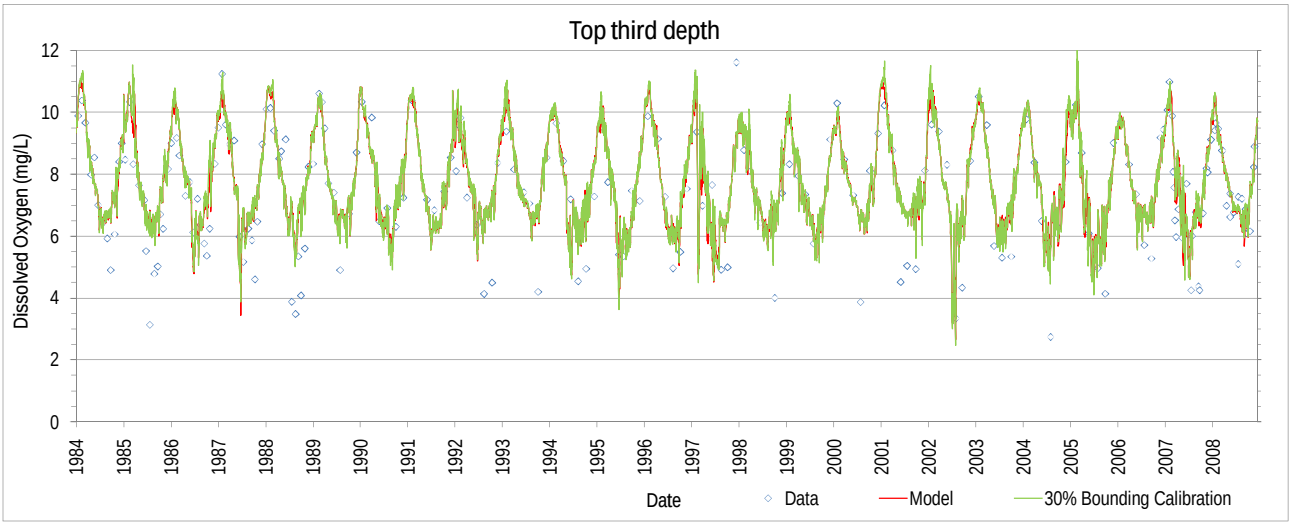


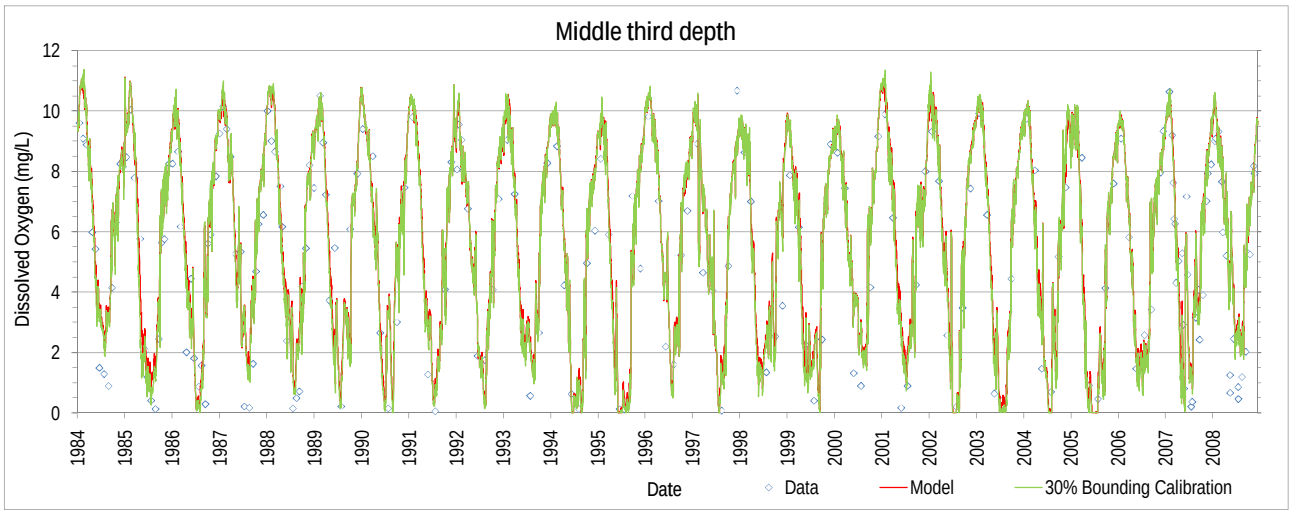
Figure 4-167 Temporal of Model versus Data for Inks Lake at Inks Dam (Segment 15) - Chlorophyll a - Bounding Calibration

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit





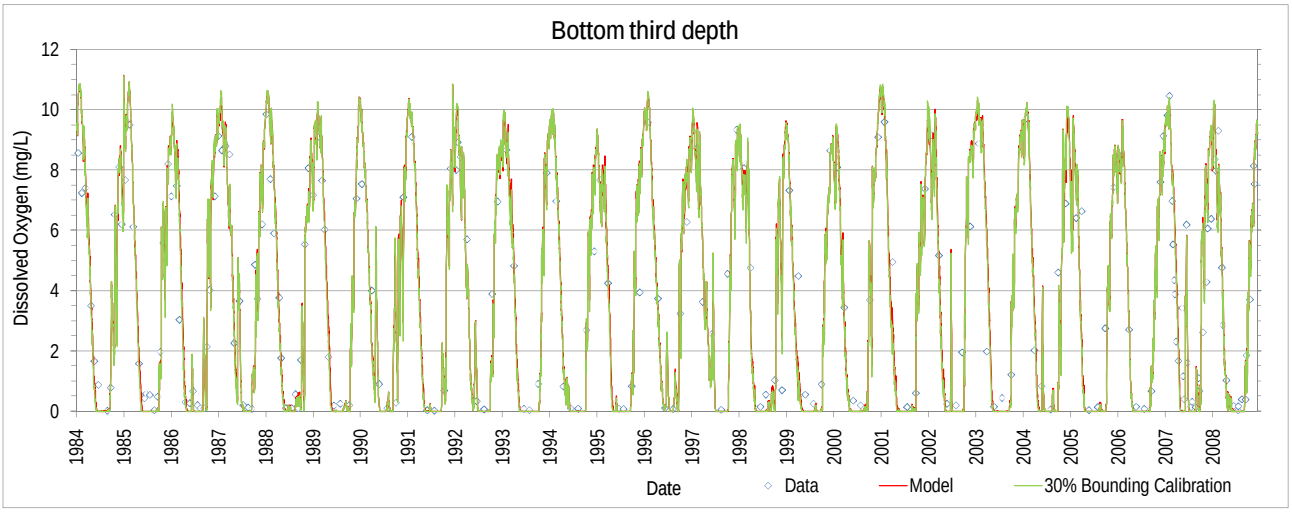


Figure 4-168 Temporal of Model versus Data for LBJ near Alvin Wirtz Dam (Segment 54) - Dissolved Oxygen - Bounding Calibration

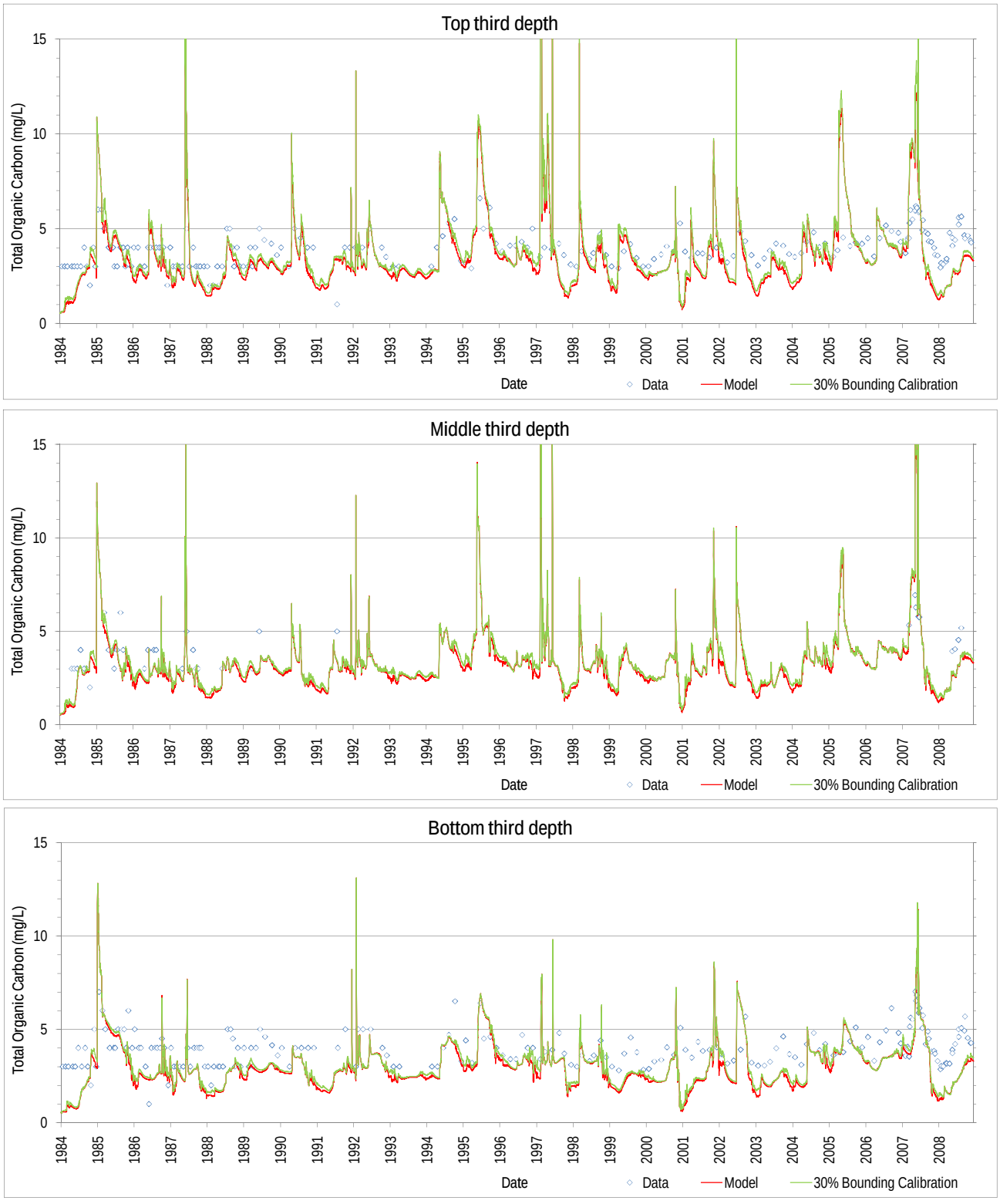


Figure 4-169 Temporal of Model versus Data for LBJ near Alvin Wirtz Dam (Segment 54) - Total Organic Carbon - Bounding Calibration

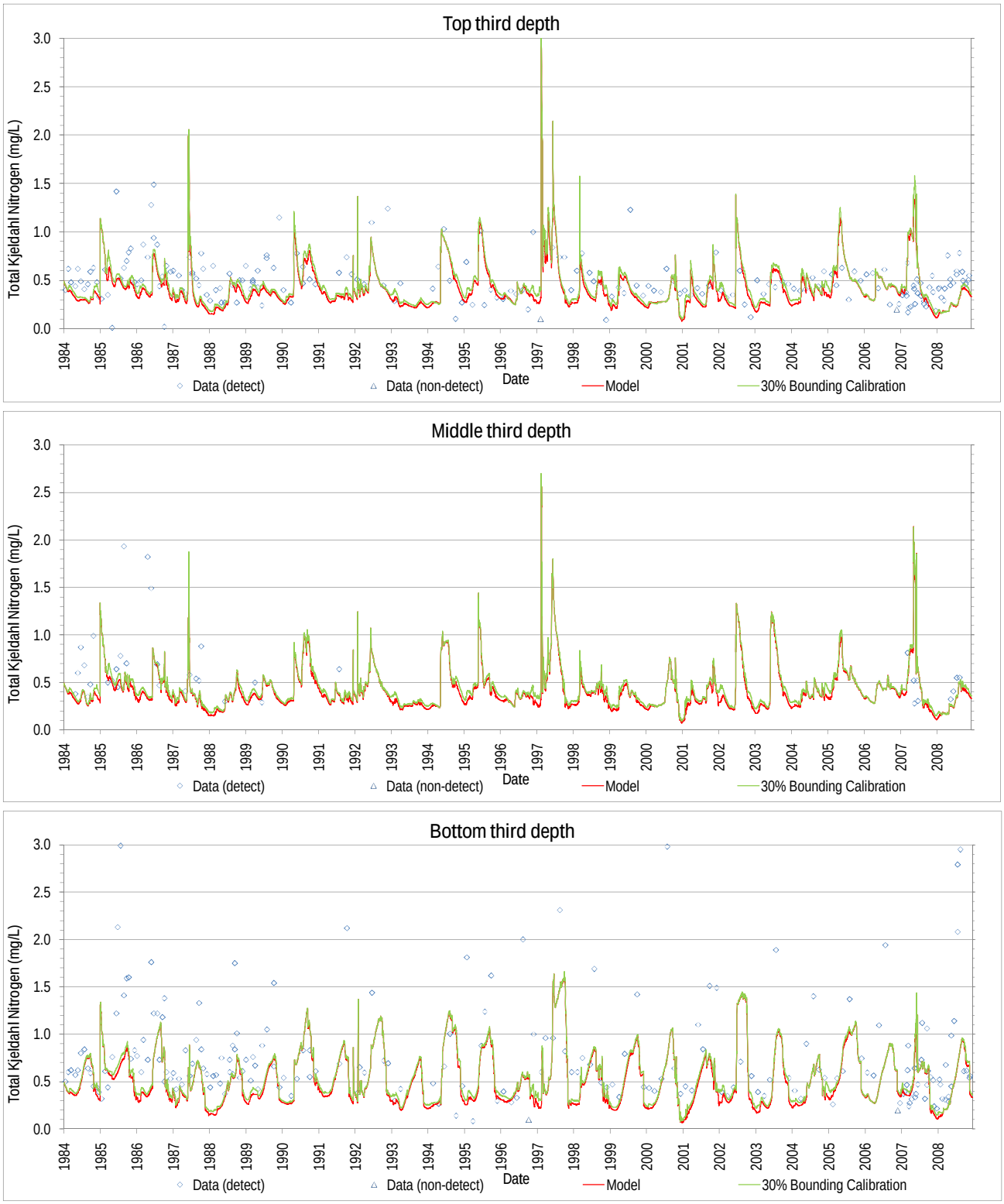


Figure 4-170 Temporal of Model versus Data for LBJ near Alvin Wirtz Dam (Segment 54) - Total Kjeldahl Nitrogen - Bounding Calibration

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

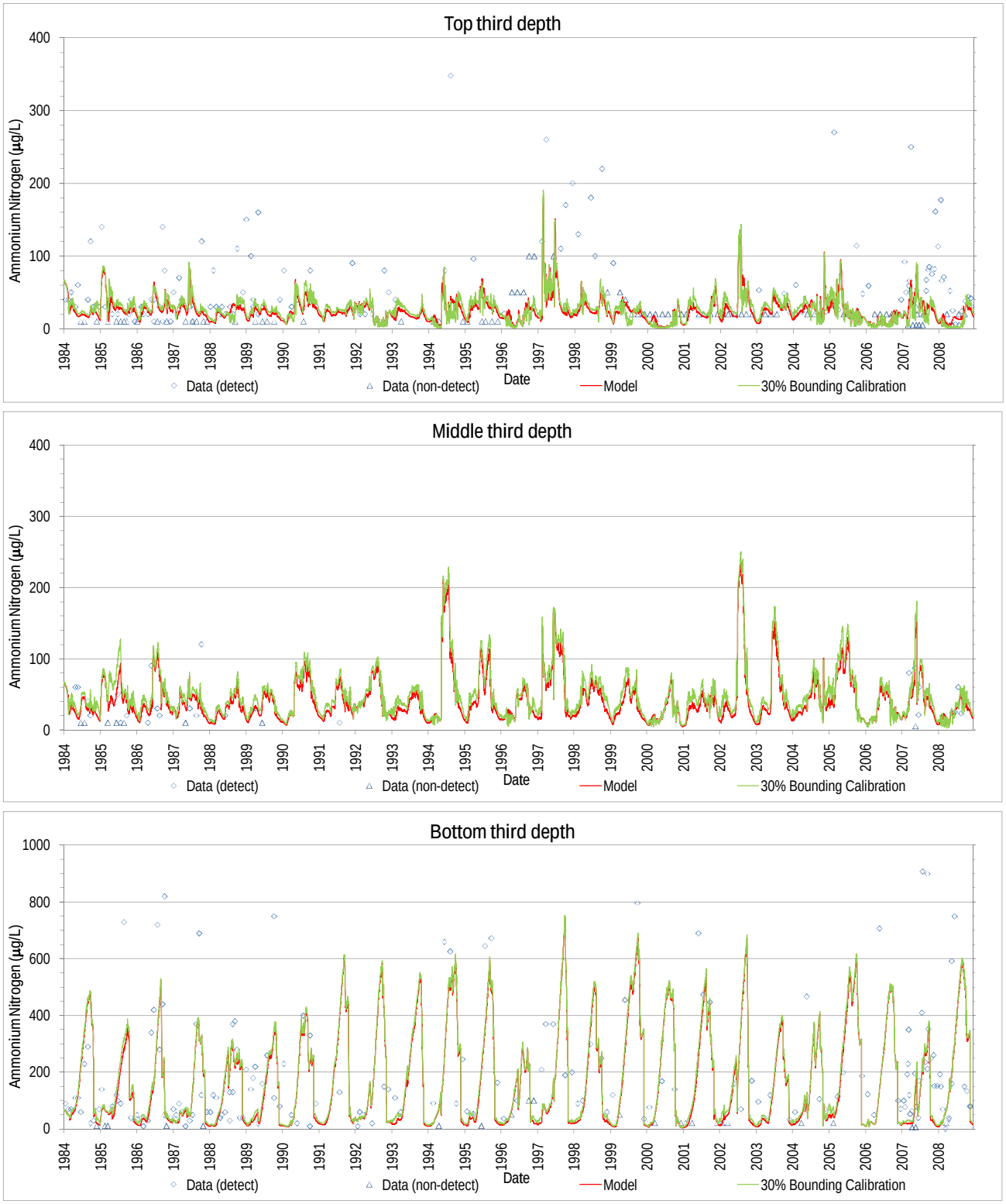


Figure 4-171 Temporal of Model versus Data for LBJ near Alvin Wirtz Dam (Segment 54) - Ammonium Nitrogen - Bounding Calibration

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

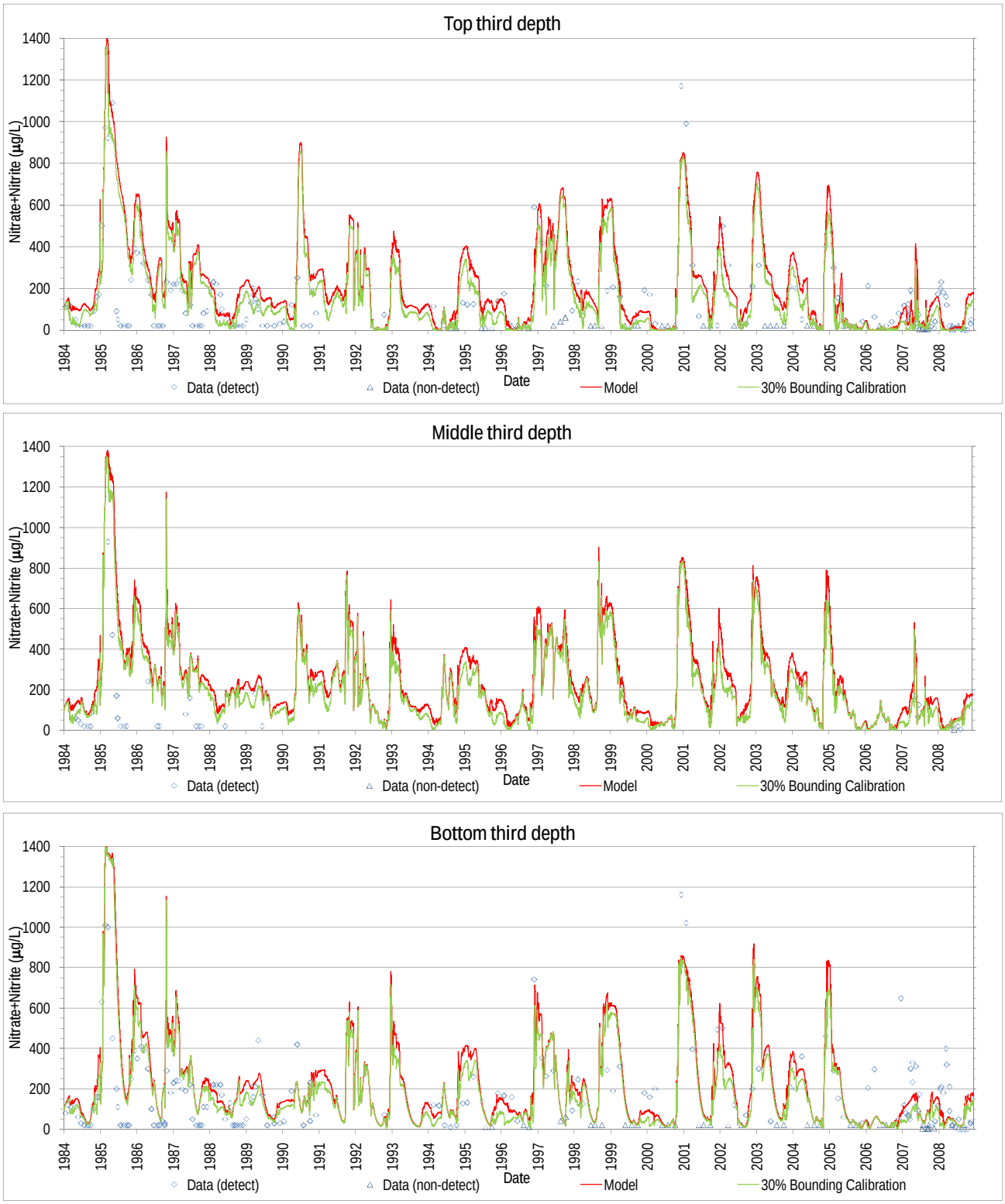


Figure 4-172 Temporal of Model versus Data for LBJ near Alvin Wirtz Dam (Segment 54) - Nitrate+Nitrite - Bounding Calibration

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

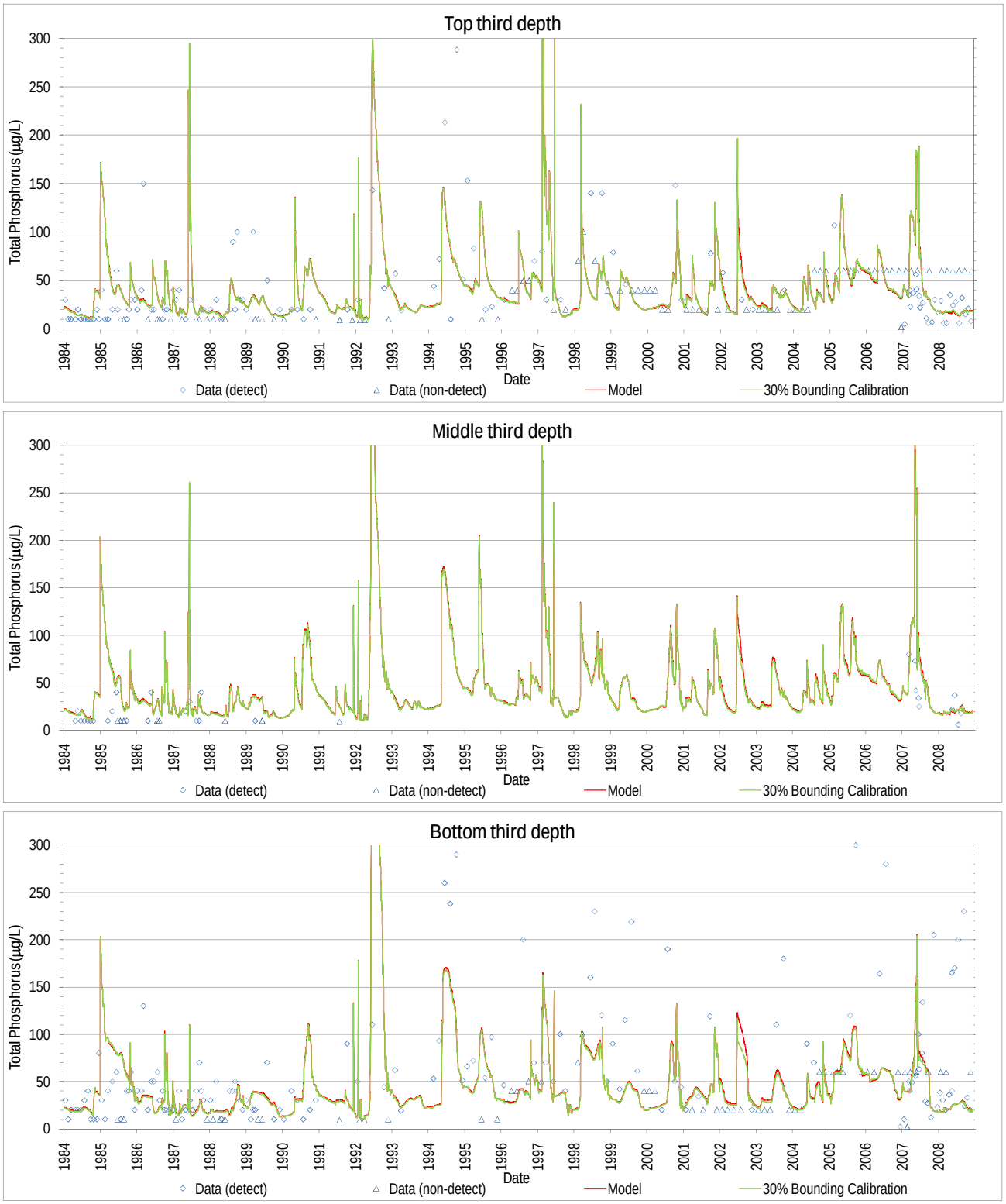


Figure 4-173 Temporal of Model versus Data for LBJ near Alvin Wirtz Dam (Segment 54) - Total Phosphorus - Bounding Calibration

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

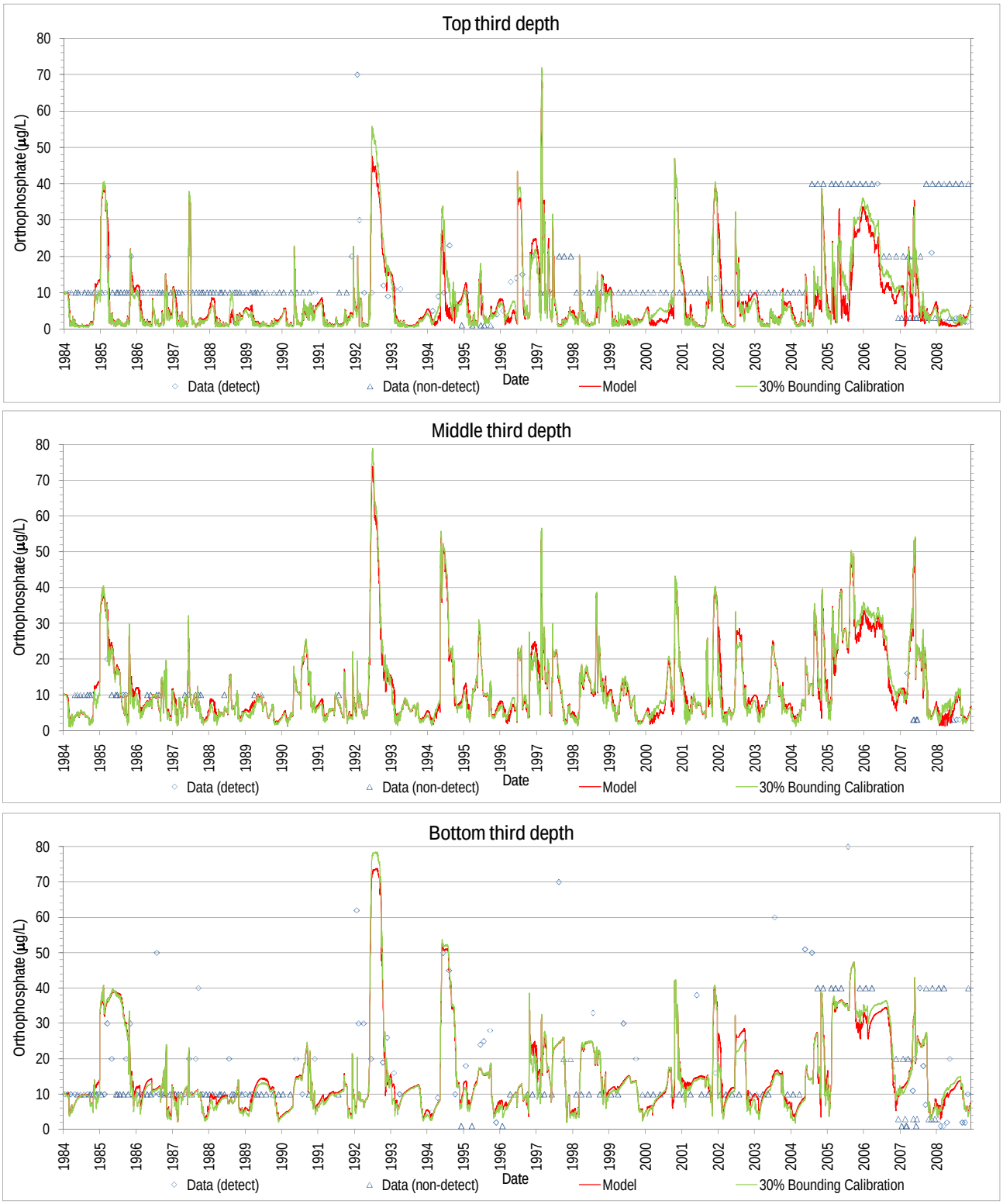


Figure 4-174 Temporal of Model versus Data for LBJ near Alvin Wirtz Dam (Segment 54) - Orthophosphate - Bounding Calibration

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

Figure 4-175 Temporal of Model versus Data for LBJ near Alvin Wirtz Dam (Segment 54) - Chlorophyll a - Bounding Calibration

Model data are averaged over water column depths shown

Each data point is a discrete measurement except when multiple measurements were taken on the same day at the same depth (average shown)

Non-detects plotted at detection limit

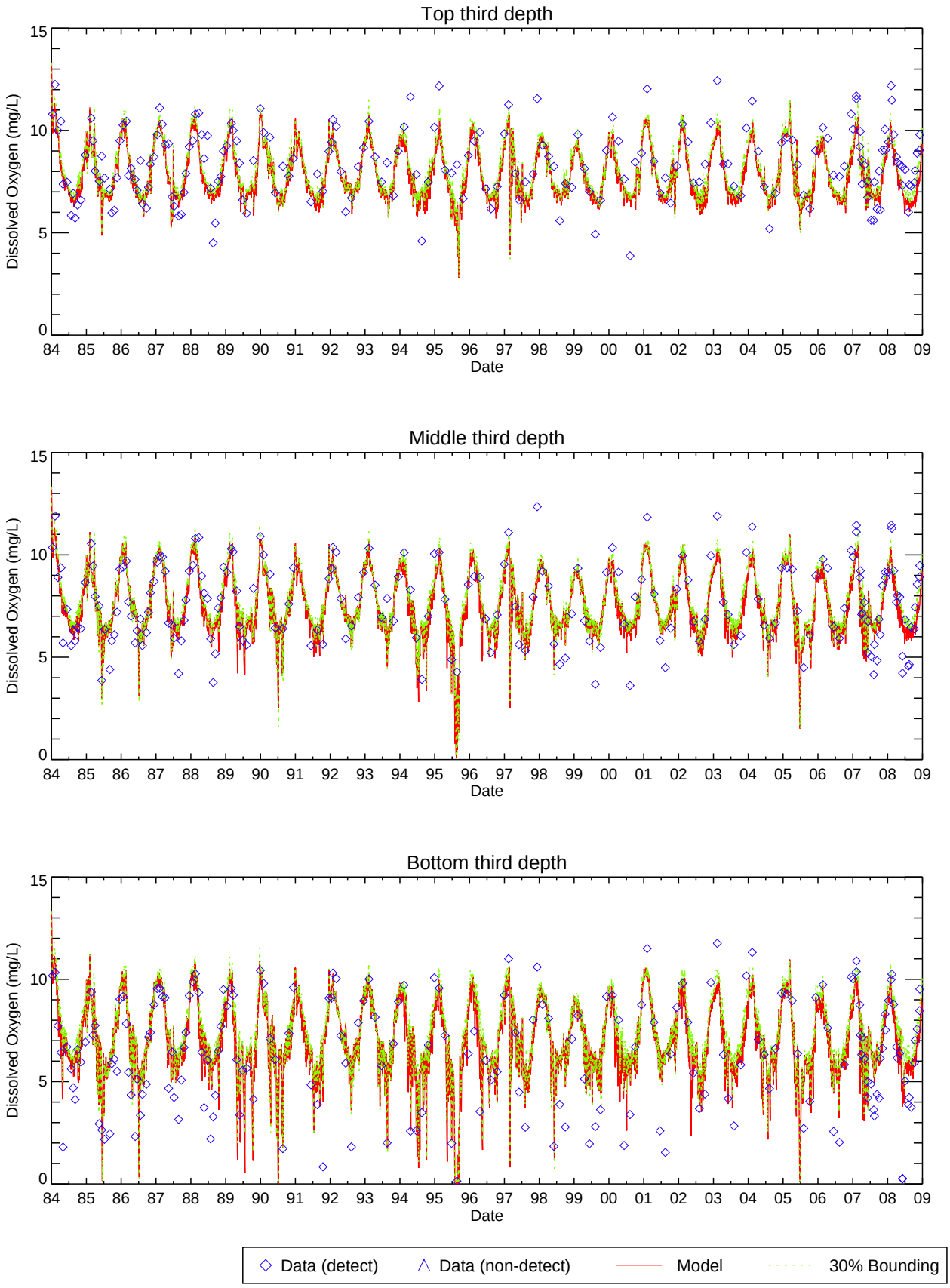


Figure 4-176 Temporal of Model versus Data for Lake Marble Falls near Max Starcke Dam (Segment 26) - Dissolved Oxygen - Bounding Calibration

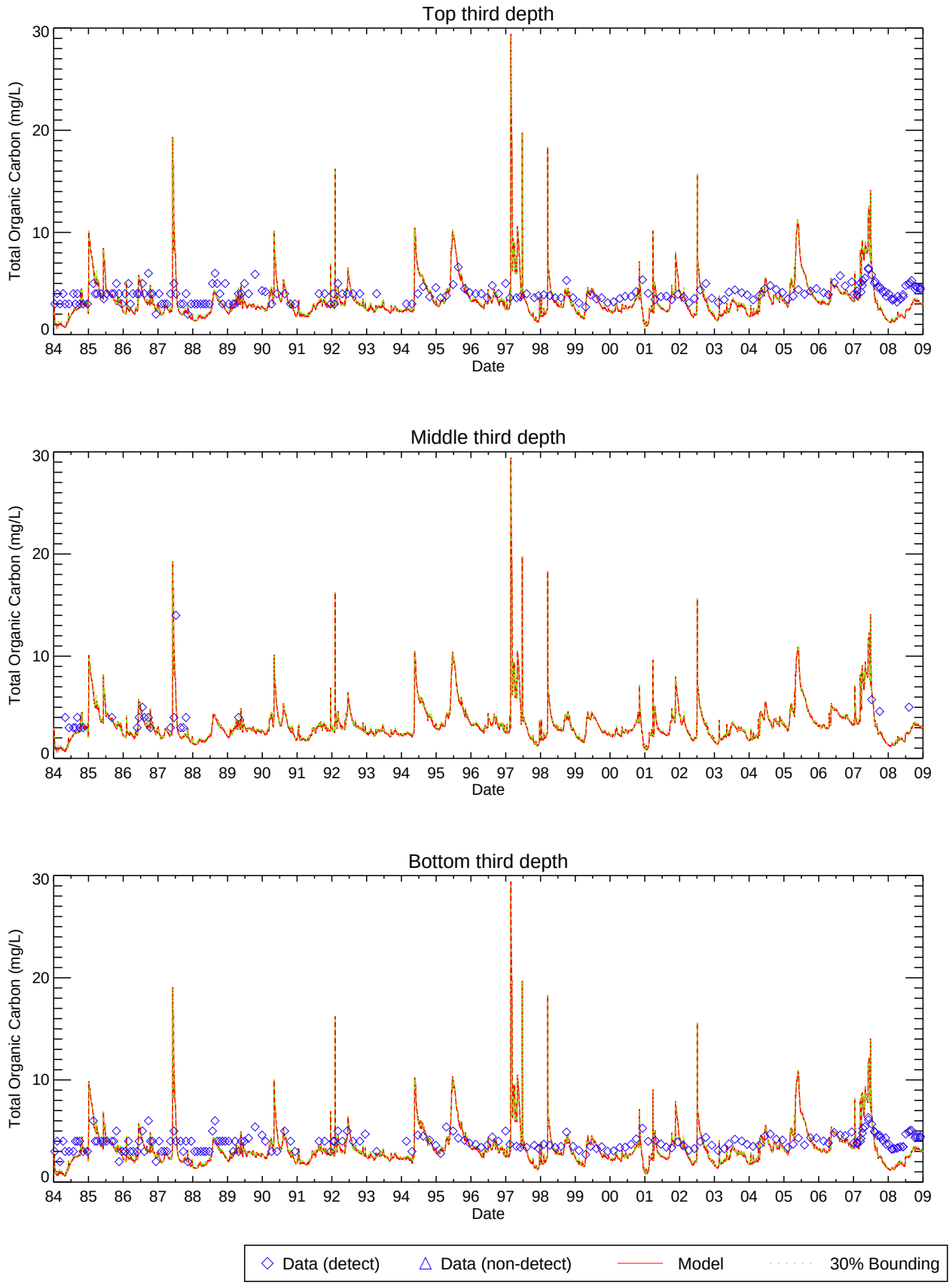


Figure 4-177 Temporal of Model versus Data for Lake Marble Falls near Max Starcke Dam (Segment 26) - Total Organic Carbon - Bounding Calibration

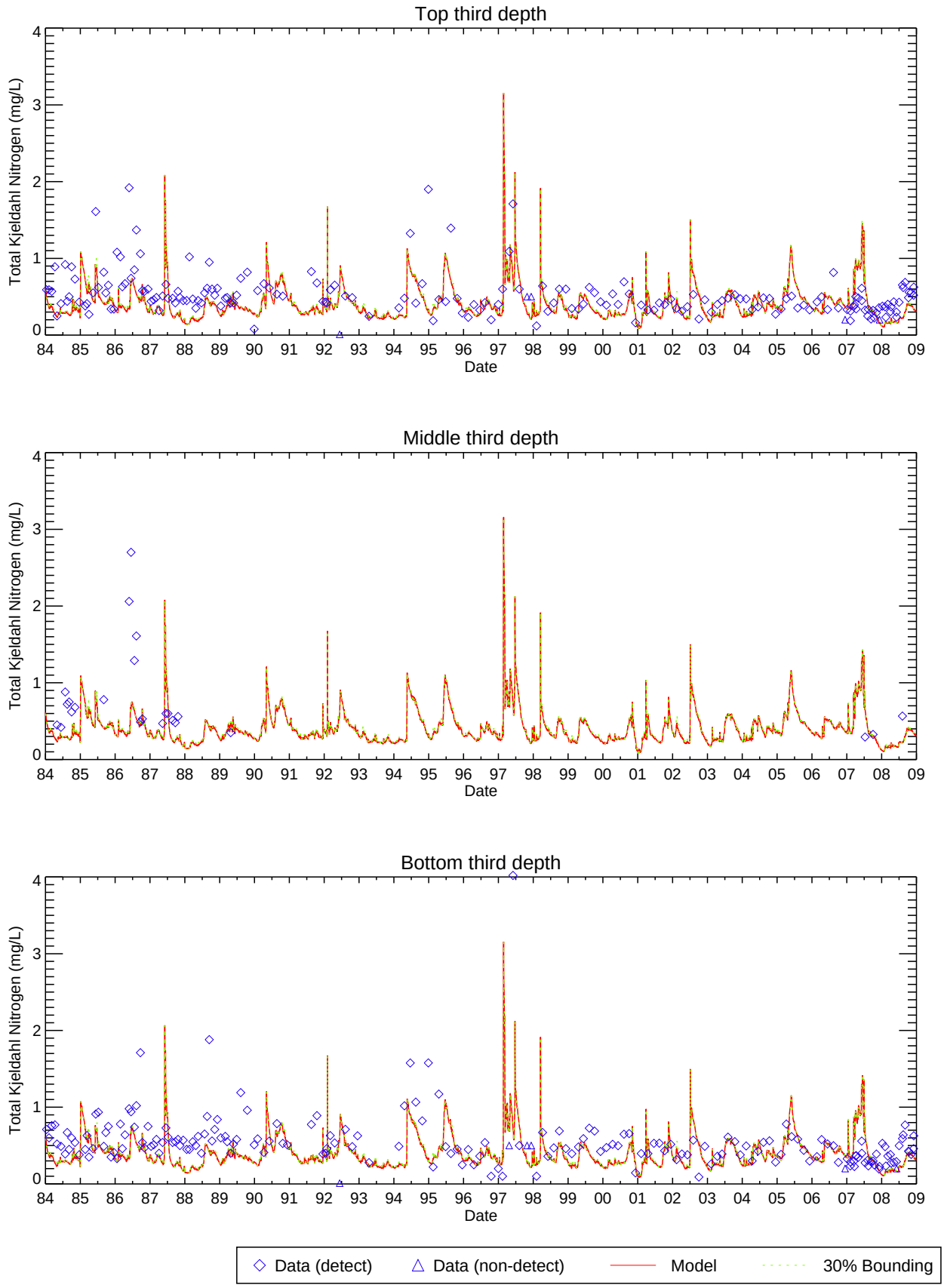


Figure 4-178 Temporal of Model versus Data for Lake Marble Falls near Max Starcke Dam (Segment 26) - Total Kjeldahl Nitrogen - Bounding Calibration

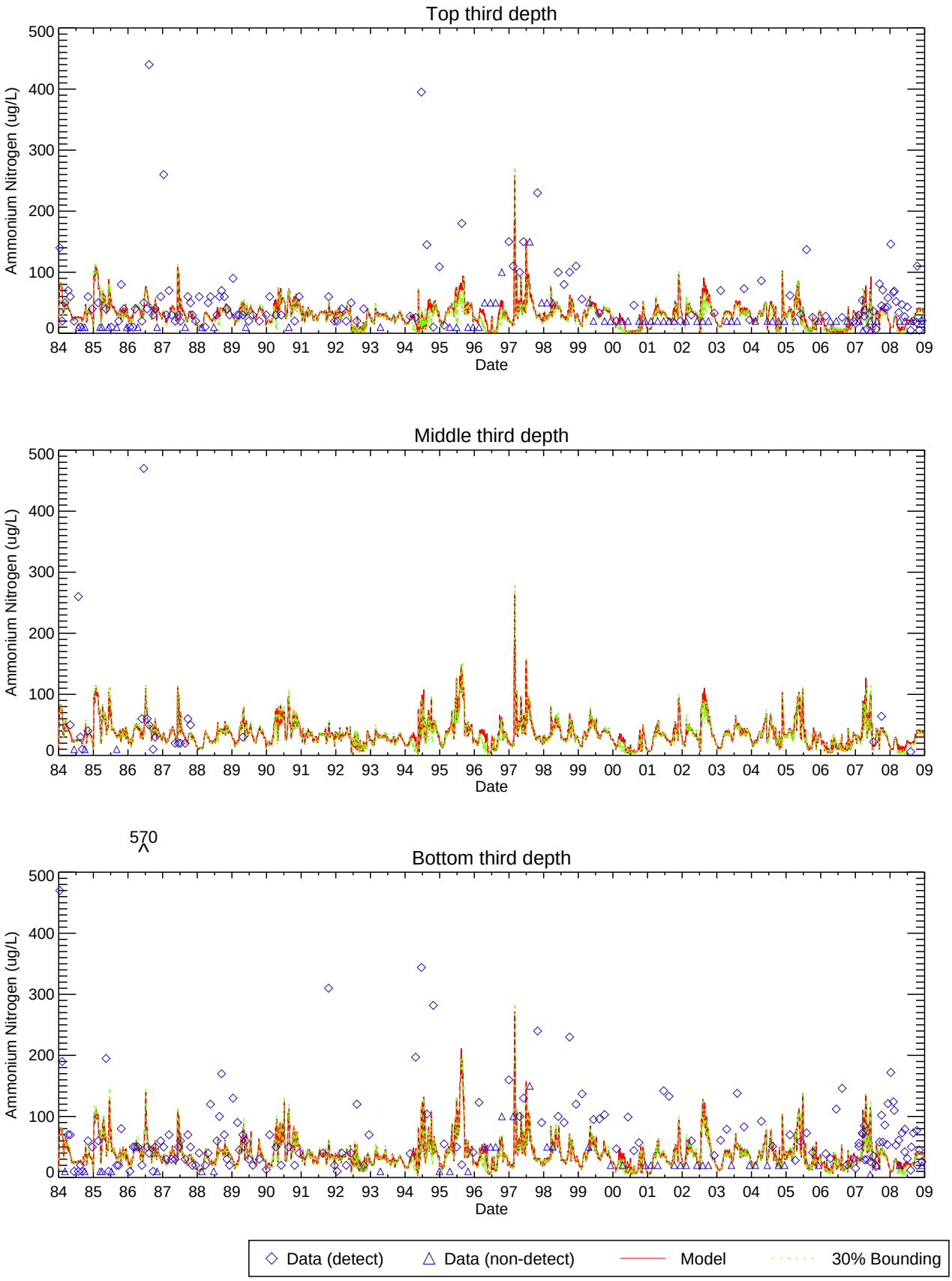


Figure 4-179 Temporal of Model versus Data for Lake Marble Falls near Max Starcke Dam (Segment 26) - Ammonium Nitrogen - Bounding Calibration

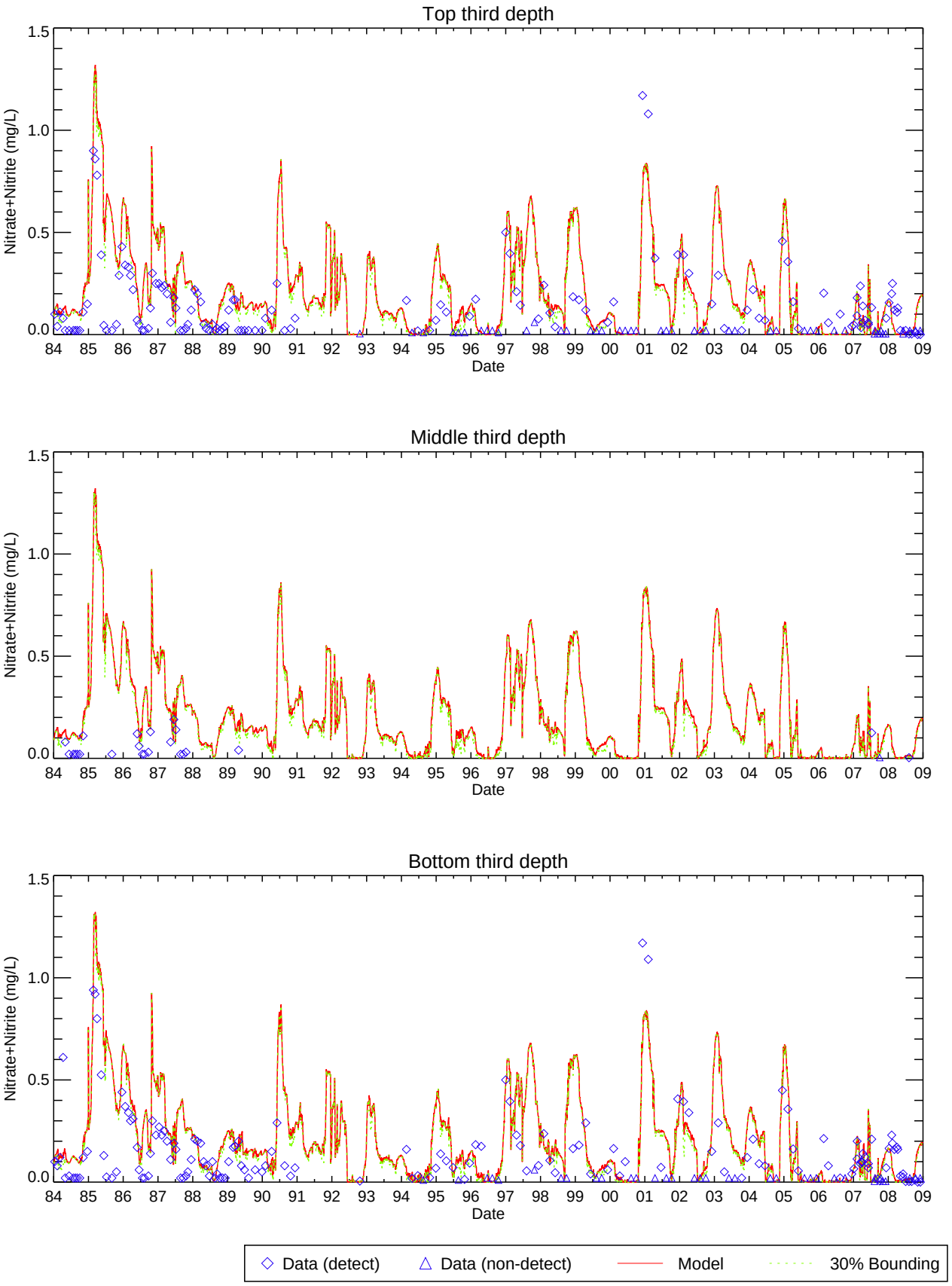


Figure 4-180 Temporal of Model versus Data for Lake Marble Falls near Max Starcke Dam (Segment 26) - Nitrate+Nitrite - Bounding Calibration

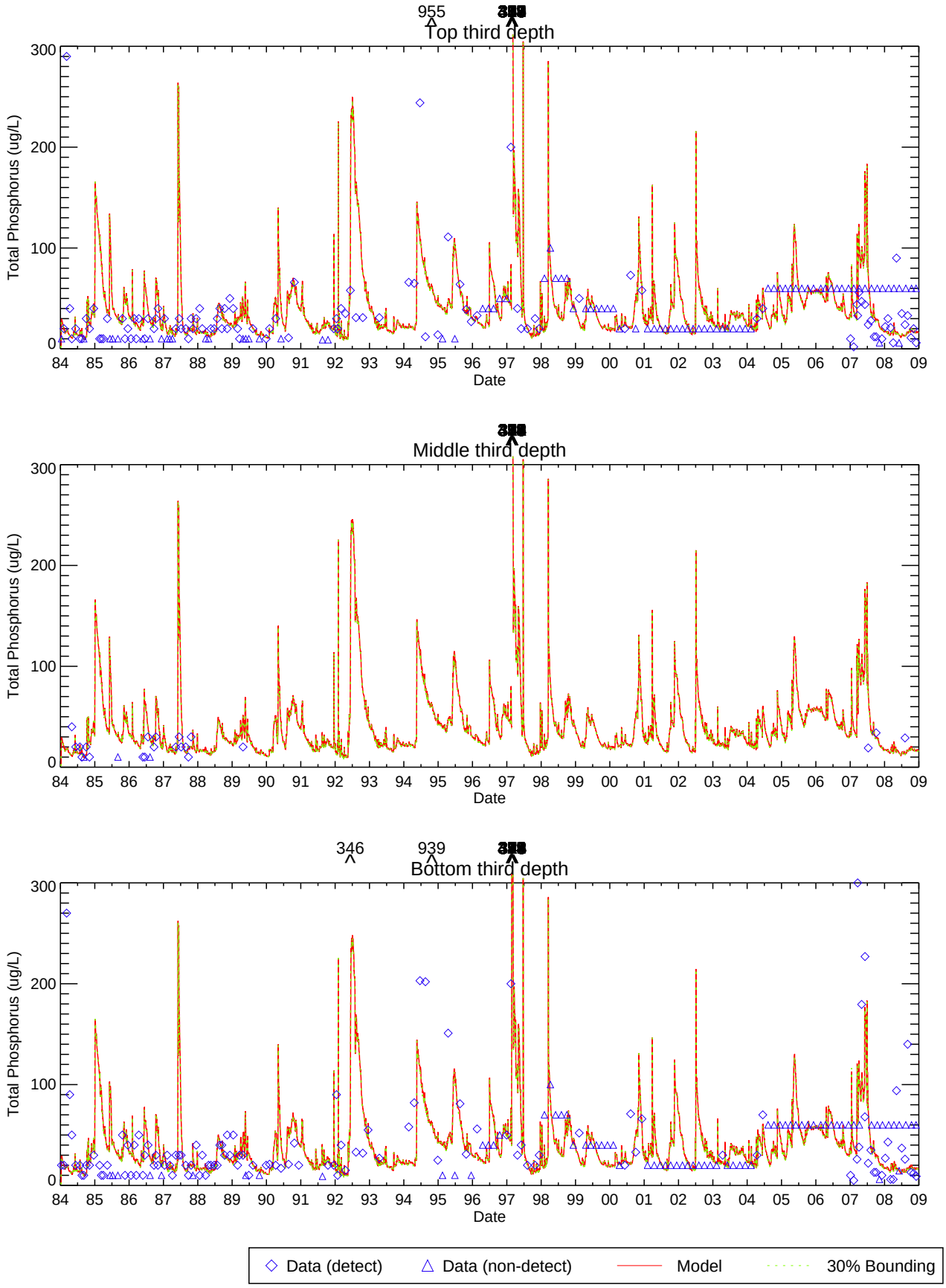


Figure 4-181 Temporal of Model versus Data for Lake Marble Falls near Max Starcke Dam (Segment 26) - Total Phosphorus - Bounding Calibration

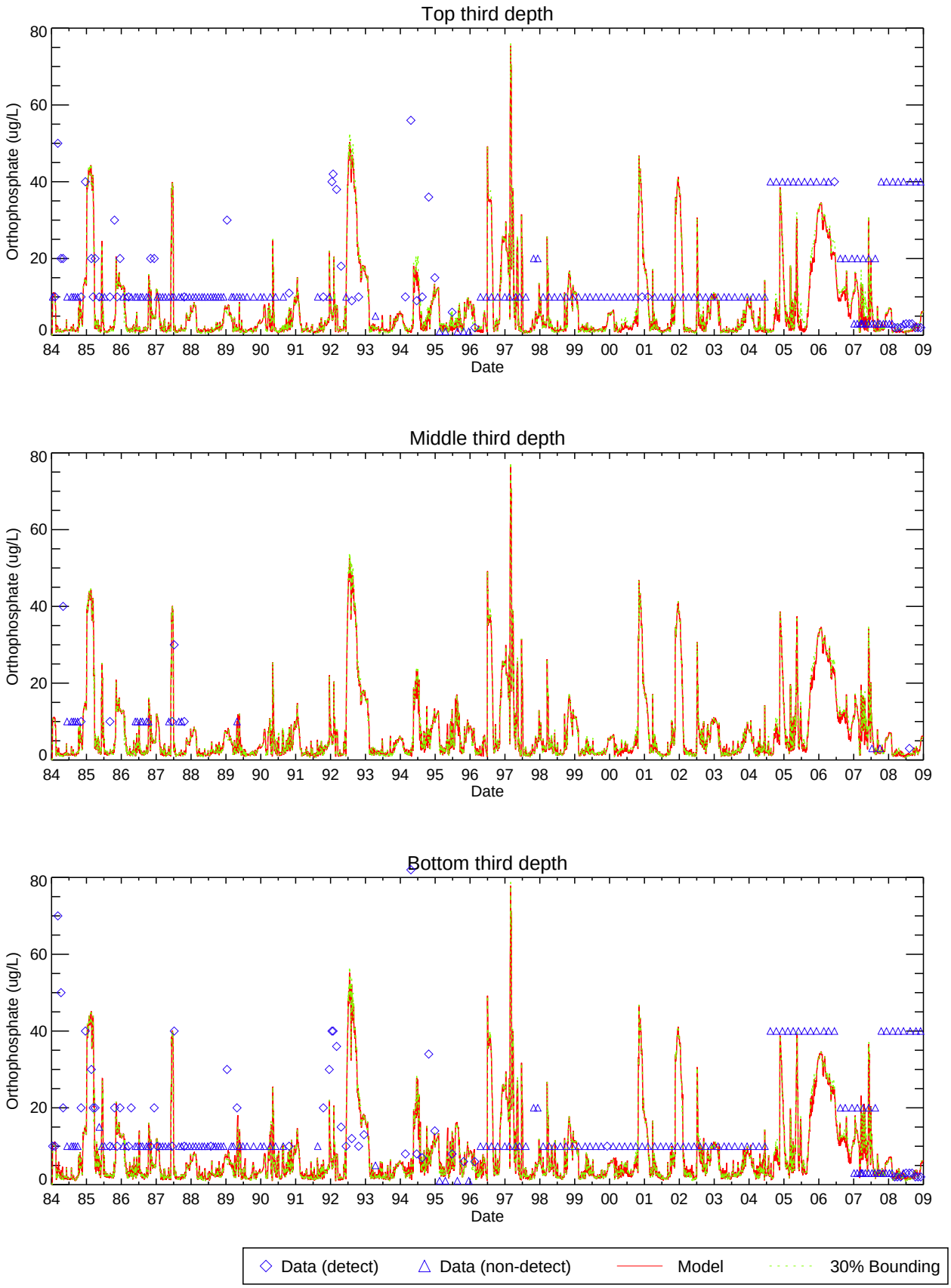


Figure 4-182 Temporal of Model versus Data for Lake Marble Falls near Max Starcke Dam (Segment 26) - Orthophosphate - Bounding Calibration

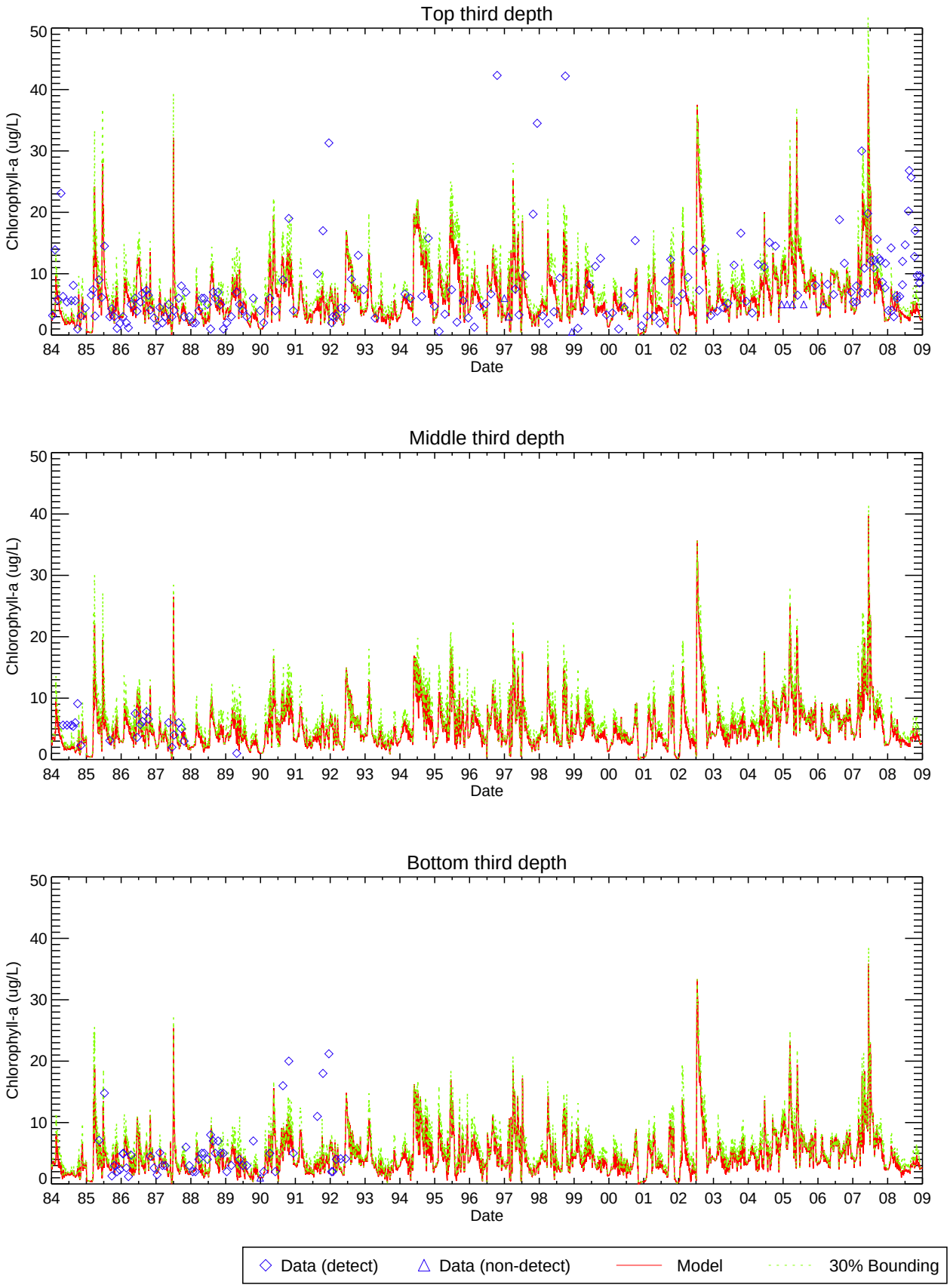


Figure 4-183 Temporal of Model versus Data for Lake Marble Falls near Max Starcke Dam (Segment 26) - Chlorophyll-a - Bounding Calibration